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ABSTRACT

A study determined critical attributes of the nation's exemplary, leading, or innovative (ELI) career-technical education teacher preparation programs. National experts identified 13 critical attributes of an ELI teacher preparation program. Researchers conducted site visits to 5 institutions--University of Georgia, University of Minnesota, The Ohio State University, The Pennsylvania State University, Virginia Polytechnic Institute and State University and used critical attributes as bases for structured interview protocols. The ELI institutions were often among those mentioned as the "most wired colleges". Institutional policies regarding computer support played a critical role in technology integration; faculty's willingness to adopt technology was an important factor. Students and faculty mentioned the rigor of field experiences and their important role in professional development. Teacher preparation and classroom practice were connected, and coursework had a congruent, well-planned sequence. Faculty members were active, high profile local and national researchers and authors. Exemplary

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faculty had a holistic view of students. Faculty shared a vision and purpose for their programs. Academic standards were integrated into methods courses; students were familiar with their state standards before they entered the classroom. Programs were responsive to standards of professional organizations. (Appendixes include 35 references, Delphi technique methodology, and attributes of ELI programs.) (YLB)

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Attributes and Characteristics of Exemplary, Leading, and Innovative Career And Technical Education Teacher Preparation Programs

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PREFACE

This report documents a nationwide Delphi study and a case study approach to identify and determine the exemplary, leading, and/or innovative characteristics in select CTE teacher preparation institutions. The case studies were based on site visits to five CTE teacher preparation programs identified by the panel of experts who participated in the Delphi study. Data collection at the sites was guided by the attributes of exemplary, leading, and innovative CTE teacher preparation programs as identified by the same panel of experts. A goal of this study was to identify the attributes of exemplary, leading, and innovative CTE teacher preparation programs, and to document how they are practiced to inform and strengthen other CTE teacher preparation programs.

The following areas were investigated at each site and represented in the interview protocols by the following themes:

- Impact of standards regarding the preparation of future CTE secondary/postsecondary teachers
- Program rigor
- Knowledge of teaching/learning processes
- Integration of academic and technical content
- Modeling exemplary teaching
- Diversity
- Professional development
- Meeting the needs of workforce education
- Partnering with other departments, public school districts, or organizations
- Exemplary/leading/innovative university practices

Many people contributed to this research and this document. At The Pennsylvania State University, several graduate students collected and analyzed data and transcribed taped interviews: Xiaorong Shao, Purandhar Dhital, and Alexandre Zolotov. Staff assistants Colleen Bloom and Dorothy Thomas oversaw the final editing and preparation of this document. Hobart Harmon was invaluable as a consultant. Carol Hodes coordinated data collection, coordinated tape transcription, organized site visits, and contributed to the writing of the document.

Finally, the authors thank the faculty at each of our sites—especially those who were the key contact persons who coordinated the visits: Betty Heath Camp at Virginia Polytechnic Institute and State University, Jane Plihal at University of Minnesota, Clifton Smith at University of Georgia, Rich Walter at The Pennsylvania State University, and Mac McCaslin at The Ohio State University.

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EXECUTIVE SUMMARY

Methods for achieving high quality teacher preparation have been one of the most contentious topics among all sectors of higher education in career and technical education (CTE). The goals of the present study were to determine the critical attributes of the nation's exemplary, leading, and/or innovative (ELI) career-technical teacher preparation programs. Using a 3-round Delphi process (Lee, 1988), a national panel of experts identified 117 attributes of an ELI career-technical teacher preparation program. Thirteen of these attributes had means greater than 3.75 on a 4-point scale.

Site directors and the directors of the Research and Dissemination Centers for CTE supplied the nominees for this panel. These individuals were selected because of their decades of knowledge of CTE teacher preparation programs and, most importantly, they had an excellent knowledge of those individuals across the country who could effectively contribute to the expertise needed in the Delphi. The expert Delphi panel also nominated the five following institutions as having distinguished ELI programs: University of Minnesota (11), University of Georgia (10), The Ohio State University (10), The Pennsylvania State University (9), and Virginia Polytechnic Institute and State University (7). Researchers conducted a site visit to each institution using the 13 critical attributes as the basis for structured interview protocols. A case study approach suggested by Yin (1994) and Mulenga (2001) was used. To triangulate data, three different protocols were developed: faculty, elite (administrative), and focus group.

Site visits were conducted so the researchers could collect the data personally. The site visits allowed the researchers to see the facilities, meet the educators, and discuss the attributes in-depth. These site visits revealed the common areas among the five top-rated institutions. The ELI institutions were often among those mentioned as the "most wired colleges" (regarding technology). Not only do institutional policies regarding computer support play a critical role in technology integration, the faculty's willingness to adopt technology was also an important factor. Both students and faculty mentioned the rigor of their field experiences and its important role in professional development. At ELI institutions, teacher preparation was connected to classroom practice, and the coursework had a congruent, well-planned sequence. Faculty members were active, high profile local and national researchers and authors. Exemplary faculty had a holistic view of their students, and were concerned about the students' family lives, in addition to their academic lives. Faculty members at ELI institutions shared a vision and purpose for their programs. Academic standards were integrated into the methods courses, and students were familiar with the standards of their own state before they entered the classroom. The ELI programs were responsive to standards of their professional organizations. Successful graduates who are knowledgeable about the standards may be the program's best recruiting tool. Finally, as a point of reference, the top five ELI institutions nominated for this study were also larger public land-grant institutions.

INTRODUCTION

Critically important to America's workforce productivity is ensuring that high quality teacher education programs prepare the nation's future career and technical education teachers. Almost three million teachers work in America's public schools. Several thousand of these are career and technical education (CTE) teachers. For example, the number of CTE teachers in agriculture, business education, family and consumer science, and technology education was approximately 76,577 teachers in 1996 (Digest of Educational Statistics, 2001). The number of elementary and secondary teachers is projected to increase by 1.1% annually, to a total of 3.46 million by the year 2008 (Gerald & Hussar, 1998). English-speaking and bilingual teacher shortages in selected subjects—especially in special education, mathematics, science, and foreign languages—threaten the future quality of education available in many schools (Stasz & Brewer, 1999). In career and technical education subjects, the demand and supply varies across CTE areas. In Michigan, projections showed a high demand and limited supply of technology education teachers, and a good demand for and a possible shortage for agricultural education teachers (Michigan State University, 2001). Gerald and Hussar (1996) projected a 16% increase in need for classroom instructors by the year 2006. Given the estimate of a 16% increase in technology education, an additional 6,075 teachers would need to be produced by 2006 (Weston, 2002).

In addition, it is critically important that America's future teachers are prepared to meet the needs of a student population in a rapidly changing and global society. According to one U.S. Department of Education report (1999), fewer than 30% of new teachers feel well prepared to enter the classroom. For new teachers in this study, it was found that only 18% felt well prepared to address the needs of diverse students, only 24% felt well prepared to integrate technology, 28% felt well prepared to implement state and district standards, and only 15% felt prepared to address the needs of disabled students (Stasz & Brewer, 1999). Further, this RAND study (Stasz & Brewer, 1999) revealed that traditional preservice programs have developed a population of teachers focused more on their own perceived needs than on the actual needs of the community. Today, jobs are becoming increasingly complex, and communities have a need for workers who can apply higher level math skills and specific scientific knowledge in the workplace (Roberson, Flowers, & Moore, 2001). Numerous calls for reforms in teacher education are starting to stimulate change. Institutions of higher education that are perceived to be leading the way to exemplary, leading, and innovative teacher education practices in CTE are the focus of this report.

BACKGROUND

Teacher preparation in CTE is characterized as decreasing in capacity (Lynch, 1990), increasing in demand (U.S. Department of Education, 2000), and changing in focus (State Directors of Vocational Technical Education Task Force on Vocational Technical Teacher Education, 1995; Holder & Pearson, 1996; Lynch, 1997; National Board for Professional Teaching Standards, 1997). There are fewer CTE teacher preparation programs and a critical need for new well-trained teachers. Since 1990, the number of CTE teacher preparation programs has declined 11% (Bruening, Scanlon, Hodes, Dhital, Shao, & Liu, 2001b). During this same time, the demand for new teachers in CTE areas shows moderate increases nationwide and critical shortages regionally (U.S. Department of Labor, 2000).

Calls for restructuring teacher preparation in the United States are increasing (Wise & Leibbrand, 2001; U.S. Department of Education, 1998; National Commission on Teaching and America's Future, 1997; Goodlad, 1990). Two recent studies, however, sponsored by the National Research Center for Career and Technical Education (Bruening, Scanlon, Hodes, Dhital, Shao, & Liu, 2001a, 2001b) reveal most programs that prepare teachers in career and technical education use a very traditional structure, with standard methods. For example, although professional development schools (PDS) have grown in popularity (Darling-Hammond, 1997; Dykeman & Mandel, 2001), as they are thought to improve the quality of teacher preparation, fewer than half of the CTE teacher preparation programs in the Bruening et al. studies reported using a PDS structure on a regular basis. There was evidence, however, that new models of teacher preparation are in their formative stages (Bruening et al., 2001b).

Two influential top-down movements appear to be causing institutions to re-align their preservice curricula to improve program quality (National Commission on Teaching and America's Future, 1997). First, the accrediting body by which most teacher preparation programs seek to be recognized is the National Council for Accreditation of Teacher Education (NCATE). NCATE began using performance-based standards in 2000. Second, some institutions have sought to align with the new teacher licensing standards of the Interstate New Teacher Assessment and Support Consortiums (INTASC).

In describing the status of career and technical education programs nationally, Bruening et al. (2001b) reported that program administrators perceived their teacher preparation curricula followed the "Standards for National Board Certification: Vocational Education" (National Board for Professional Teaching Standards, 1997). These researchers also acknowledged changes occurring in the pattern of course delivery. For example, administrators of CTE teacher preparation programs planned to triple their Web-based course offerings within the next 3 years.

Improving teacher education is a huge undertaking. Teacher preparation is a multifaceted choreographed play in which state-directed certification rules, university standards, and student interests must be balanced in such a way that half of the audience (potential students) aren't scared away. Increasingly, this balance has become more difficult as more standards and reforms are weighing on student requirements. One of the challenges will be to maintain the changes needed in education while maintaining potential local CTE teachers' interest.

The goals of the many reform movements are unique to the situation and creativity of each developer. In California, a Professional Development Center concept in local schools has started to bridge the gap between local schools and universities. In this model, a blend between the local school staff and university personnel occurs. The purpose of the center is to:

- Offer a classroom where selected courses are taught to a cohort of students in the university teacher education program;
- Provide a site for inservice workshops, seminars, demonstrations classes, and meetings;
- Have a lab site for working with induction teachers on a one-to-one basis;
- Serve as a resource room with books, videos, and materials available for teachers' use;
- Provide a site to mentor faculty (Maxson & Schwartz 2001, p. 254).

In the New American Schools movement, professional development is seen as the key to developing the capacity to teach effectively. This results-driven approach to education suggests that teachers must have a high ability to verbally communicate, be able to use a wide range of teaching strategies adapted to student needs, be knowledgeable of teaching and learning, and have a good knowledge of subject matter (Haslam & Seremet, 2001). The four characteristics of high quality professional development are:

- Focus on content knowledge and content-specific pedagogy;
- Engage teachers and principals as active learners and problem solvers;
- Provide learning opportunities that are embedded in the daily work of teachers and principals; and
- Is based on research and examples of best practices (p. 7).

If these are the goals for existing teachers, then it seems logical that they should also apply to beginning teachers.

Professional Development Schools (PDS) offer still another method of linking the teacher education institution to the local school. This model facilitates a large exchange of information from local teachers, student interns, and university faculty. Responsibility for pedagogy of the student intern is shared by the cooperating teacher in the local school and the university professor. Students gain from working directly with students for an extended period of time. Some PDS programs last an entire school year, with the student intern gaining more responsibility each week. As a result, a tremendous amount of information is exchanged between university faculty and local teachers. Student interns are able to take on more teaching responsibilities as they become better prepared. Student interns are better able to see a connection between local schools and parents, which is not visible in university settings. Universities gain through the collaboration and inquiry possibilities that exist through these partnerships. This approach tends to focus the pedagogical learning in real settings, deemphasize rote memorization of facts, and encourage collaborative inquiry.

Many new models of educational change and reform are taking place in higher education. The three models presented here are just a sampling of the examples currently undertaken in the United States. Clearly, teacher education in general, and CTE teacher education, needs to reform

if it is going to be successful in meeting the needs of its students and, ultimately, the public. The questions that arise are related to the referenced literature. What are the qualities and attributes of institutions that prepare CTE educators? What are the attributes of the leading institutions that others could emulate? What approach is working most effectively at the leading institutions? What attributes are the most important to develop in a new CTE teacher? What are the best strategies for providing undergraduate educations to those who want to become CTE teachers in local schools? What are the exemplary, leading, and innovative teacher preparation programs, and what sets them apart from the rest?

THE PURPOSE AND OBJECTIVES

The purpose of this study was to identify the critical attributes of exemplary, leading, and innovative CTE teacher preparation programs and practices. This report, sponsored by the National Research Center for Career and Technical Education, describes core factors important to the quality of CTE teacher preparation. Current teacher preparation is a challenging process across the United States. Student-achievement state certification standards change constantly. Leading teacher educators engage in large debate about the changing rules that govern preparation of future teachers. The public is demanding higher accountability for everyone working in education. In addition, the methods of obtaining teaching licenses have recently changed in nearly every state. Ultimately (and soon), these modifications need to change the approach used in CTE teacher education. This study was initiated to better understand and describe what the leading institutions are doing to meet the new rules, standards, and opportunities related to developing the next generation of CTE teachers. The objectives of the study were to: a) identify and describe the characteristics of the leading CTE teacher preparation institutions, and b) identify the exemplary, leading, and innovative attributes of CTE teacher preparation programs.

THE METHODOLOGY

The methodology of the study was based on a mixed-method (quantitative and qualitative) approach. The researchers first identified the exemplary, leading, and innovative attributes. To do this, a Delphi approach was followed. (*Please see the next section of this report for the processes used to select the Delphi panel, and the procedures used to complete the Delphi portion of the study*). Once this was completed, the researchers conducted a case study of the five institutions identified by the Delphi study as outstanding teacher preparation programs. The Delphi data contributed to the direction of the case study data-collection process. The case study approach was qualitative. Data were collected through elite administrative interviews and focus groups with students and program graduates. The research team conducted one-on-one interviews with key teacher preparation faculty members. The research team also made on-site observations. Given the nature of the mixed qualitative approach, it was impossible and inappropriate to ask the focus group the same set of questions that was asked of the elite interviews and the one-on-one interviews. The Delphi ELI attributes guided the formation of questions and, to a large extent, the research effort. Some of the richness of the data came from unchoreographed responses to follow-up questions.

The individuals who participated in the qualitative case study were nominated to the research team by a key university CTE resource person at each site. Since this was a descriptive study to identify the attributes that were working effectively in the CTE teacher preparation program, no attempt was made to find outside individuals, to crosscheck the data. Given the large number of people interviewed at each site (about 30 people, on average), data triangulation was central to the analysis effort. At some sites, the data may seem directed, with more data coming from one or two areas of the CTE program offering; this phenomenon should be viewed as another source of data and information. At one time, all of these institutions had robust, comprehensive offerings. However, it is obvious that all of these institutions have had some slippage in program offerings. This observation is not due to researcher bias, but rather to the makeup of the programs as the researchers found them.

Case-study profiles, including attributes, for the five institutions receiving the most nominations as exemplary, leading, and/or innovative, appear in this paper's Summary. Site visits to the five institutions yielded descriptions of issues that will assist with clarifying and implementing innovations. And, the conclusions present the most significant implications for policy makers, practitioners, and researchers who seek to address teacher preparation in career and technical education.

Limitations of the Study

Interviews were conducted with selected faculty and administrators who were identified as key by local university contact people. While the individuals' roles were described, the researchers had little control over the individuals interviewed. Consequently, the case study research team conducted phone interviews with some individuals not present during the on-site visits.

Focus group members were identified, recruited, and selected based on their proximity to campus and on the recommendation of key university contacts. Therefore, not all CTE disciplines are equally represented in the case studies.

Focus group methodology dictates that all 13 attributes should not be discussed with both the focus groups and with the elite interviews.

This study was descriptive; therefore, no attempt was made to go beyond the data and explain *why* the ELI attributes were effective.

Data analysis decisions were made on an a priori basis for each study phase. Therefore, data in the narrative may not agree with data in the appendix, since the data in the appendix also contains Round III data. The decision to reject or accept the data occurred at the end of the second round of the Delphi. Three of the statements in Round III did not meet the a priori standard (M = 3.75) established in Round II.

THE DELPHI STUDY

The Delphi technique was used to identify attributes of exemplary, leading, and innovative (ELI) CTE teacher preparation programs across the United States. One of the more common research methods used in CTE research (Wonacott, 2000), the Delphi method solicits input from experts who do not interact (Lee, 1988). It is particularly useful when seeking agreement on a complex phenomenon from a geographically dispersed, heterogeneous group.

This heterogeneous panel responded to a sequence (or round) of questions. Several rounds were necessary to reach agreement. The number of rounds depends on how quickly consensus is reached; studies often require from three to nine rounds. Researchers analyzed responses from the first and second rounds to determine patterns and outliers, which they summarized and returned to the panel for the third and final round.

Individuals were nominated from across the country. Each coordinator (five) and the research and directors for National Centers for Career and Technical Education nominated individuals from across all types of CTE teacher educator dissemination institutions—from community college to Ph.D.-granting institutions. The site coordinators were: Jane Plihal at University of Minnesota, Edgar Farmer at The Pennsylvania State University, Debra D. Bragg at the University of Illinois at Urbana-Champaign, Wayne Haverson at the University of Oregon, and Mac McCaslin at The Ohio State University.

Nominators were also encouraged to suggest business and industry representatives and others knowledgeable about CTE teacher education and who could effectively contribute to the theme of exemplary, leading, or innovative CTE concepts. Small and large universities were represented from across the nation. By May 2001, 81 potential participants representing 34 states from all regions were invited to participate. This initial group had 54 (67%) males and 27 (33%) females. Four individuals declined the invitation to participate in the study, and some attrition occurred between Delphi rounds.

Forty-four panel members with extensive experience in CTE teacher preparation participated in the third and final round of questions necessary to reach agreement on the ELI attributes. About two-thirds of the 44 participants in Round II were male. And the following sectors were represented: administrators or faculty in CTE teacher preparation programs (36), community college faculty (2), state or federal departments of education (4), and private business (2). The panel's diversity of geography, gender, and CTE area of interest provided a broad base of information that added credibility to this study. A more detailed description of the Delphi study methods and procedures is found in Appendix A.

Of the 117 original attributes created from panel members' responses to open-ended questions in the first round of the Delphi study, the experts "strongly agreed" on 73 items (about 62%) and "agreed" on the remaining 44 items (38%). Panel members rated each item on a 4-point Likert-type scale of 1 = strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree. A "don't know" response was also possible, and counted as missing data for analysis purposes. Mean ratings ranged from 2.50 to 3.49.

Completed in August 2001, the third and last round of the Delphi study gave participants the opportunity to change their Round II responses, upon seeing the group's mean and learning that 71 attributes had a mean rating of 3.5 or higher. For Round III, individual surveys were prepared for each panelist. Changes were minor, with the top five items remaining very stable. Dependent *t* tests found no significant differences between the pairs of means. The means and standard deviations of the 117 attributes (resulting from rounds II and III) appear in Appendix B by category.

The cutoff score for questions derived from the variables after Round II was arbitrarily set at mean 3.75 a priori. Any question not making this cutoff score was not included in the case study research phase. Round III was conducted to validate the set of variables. Three of the variables from Round II fell below the 3.75 cutoff score for Round III. Arguably, a small number of the variables on both sides of the cutoff from the second and third rounds may merit further attention as attributes that researchers should review to strengthen CTE teacher education programs.

Table 1 shows the 13 program attributes that had the strongest agreement among the panel members, with a mean rating of 3.75 or greater. The two attributes relating to outcome standards and academic rigor received the strongest agreement among the panelists. Three attributes that relate largely to preparation for classroom teaching had the next-highest mean ratings. Updating content to be consistent with the evolving needs of workforce education, administrators, and teachers complete the list of the top attributes of exemplary, leading, and innovative CTE teacher preparation programs.

Table 2 shows the attributes that panel members rated the lowest. Included in the list are attributes related to creating a study group with university affiliation, providing direct links to industry training programs, having degree completion rather than certification as a terminal objective, certifing graduates based on a qualifying exam, and testing students as a condition of program entry and exit. This information provides the reader with an understanding of the items that were not highly ranked by the panel of experts.

Table 1
Highest Rated Attributes of Exemplary CTE Teacher Preparation Programs

Attributes	Round II	Round III	Rank*
Is rigorous and equivalent in scope and depth to other (academic) teacher education programs.	3.88	3.93	1
Has outcome standards in place that relate to curriculum, pedagogy, technology, student learning, and development.	3.88	3.85	1
Has faculty who are knowledgeable in the areas of teaching and learning, educational content and processes, assessments, and research design and processes.	3.84	3.85	3
Uses teachers who model exemplary teaching.	3.84	3.83	3
Prepares teachers for classroom management needs.	3.84	3.80	3
Integrates academics into career and technology programs.	3.80	3.73	6
Has a strong base of subject matter including learning theory, work-based education, general education, and clinical experiences.	3.79	3.83	7
Emphasizes inquiry and critical thinking.	3.79	3.78	7
Encourages continued professional development.	3.77	3.76	9
Uses instructional strategies and delivery methods based on "best practices" concepts.	3.77	3.76	9
Emphasizes working with diverse populations.	3.77	3.73	9
Updates contents to be consistent with the evolving needs of workforce education.	3.76	3.78	12
Demonstrates partnering effectiveness with school administrators and teachers.	3.75	3.69	13

*Rank is based on Round II. The rank of 1 indicates the highest ranking item.
Note: Agreement with these attributes was indicated with a 4-point Likert-type scale:
1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree, and 9 = don't know.

Table 2
Six Lowest Rated Attributes of Exemplary CTE Teacher Preparation Programs

Attributes	Mean	Rank
Creates a study group with university affiliation.	2.85	112
Provides links directly to industry training programs.	2.83	113
Has degree completion rather than certification as a terminal objective.	2.78	114
Certifies graduates based on a qualifying exam.	2.69	115
Screens students with aptitude tests and assessments (for program entry and exit).	2.65	116
Certifies teachers after one full year of a successful classroom teaching internship (for program exit).	2.51	117

Note: Agreement with these attributes was indicated with a 4-point Likert-type scale: 1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree, and 9 = don't know.

In the second and third rounds of the Delphi study, in addition to rating each attribute, panel members nominated 33 exemplary CTE teacher preparation programs. While many of the characteristics and attributes identified in this study exist within all nominated institutions, five nationally recognized institutions received the most nominations: University of Georgia, University of Minnesota, The Ohio State University, The Pennsylvania State University, and Virginia Polytechnic Institute and State University. Each is a Ph.D.-granting, National Council for Accreditation of Teacher Education (NCATE)-accredited, public land-grant, research-oriented institution. Two teams of researchers conducted site visits to the five institutions. (See Appendix A, Table 9, for a list of nominated institutions not included in the case study.)

THE CASE STUDIES

Interview protocol

The 13 attributes for exemplary, leading, and innovative (ELI) teacher education programs were used to guide interview and focus group protocols. Faculty, program chairs, and deans were interviewed during the site visits. Two separate focus groups were conducted at each site. CTE local school teachers (program graduates) and current graduate students in the CTE teacher preparation programs were asked to respond to a series of questions derived from the top 13 attributes found in the Delphi study. (It would have been impossible and inappropriate to ask all 13 questions.) The researcher determined the specific questions a priori. Information from the on-site visits was used to describe what made each program one of the ELI CTE teacher preparation programs in the country. Approximately 30 people were interviewed at each site. Teachers selected for the focus groups were selected based on their proximity to each campus. The local contact person at each university was asked to select individuals of various ages, backgrounds, and CTE disciplines. No attempt was made to select teachers or students outside the pool identified by the local university contact person. Since the focus of the research was to identify the ELI attributes at each institution, the researchers were less concerned about bias, which would be critical in a comparative or analytical study. However, each person's role in CTE was discussed at the beginning of each interview. In one case, an individual dismissed themselves from the interview process as the research team and the individual determined that they would add little to the data collection process.

The data is presented in the next section, with each site presented similarly. Summary data of each university is not presented in any order of importance. The data was not collected in the order in which it is presented in this document. A summary table is presented at the end of each site narrative. The summary table includes the institution type, CTE areas, administration, paths to licensure, and ELI attributes. In each summary table, the ELI attributes are broken into two categories. The first category is titled Signature Attribute and the second category is named Distinguishing Attributes. The signature attribute denotes which ELI attribute the research team believed was the strongest characteristic for that institution. The distinguishing attributes contribute to the comprehensive ELI picture developed as a result of each site's case study.

SITE PROFILES

In fall 2001, teams of researchers visited the five institutions that received the most nominations by Delphi panel participants. This section profiles results of each visit to: University of Georgia, University of Minnesota, The Ohio State University, The Pennsylvania State University, and Virginia Polytechnic Institute and State University.

Site 1: University of Georgia

Program Characteristics

CTE programs at the University of Georgia reflect the philosophy of the University and the College of Education. According to one college administrator, "We pride ourselves on cutting edge movements. They filter down from university to college to department. We are a very large college in the nation. CTE faculty members are known for scholarship, teaching, and service. We like to be cutting edge." Specific programs in the college examine different educational models to determine the best approach. Research heavily influences curriculum and teaching methods in the College of Education. The administrator added: "We are using the contextualized leadership model. We like not having to live in the past. Our strength is faculty. We hire innovative, solid faculty. We think that we are good."

The State of Georgia is one of a few states that use State lottery money to support students attending college. Students with a 3.0 grade point average in high school can receive free tuition and textbooks through a HOPE Scholarship. This enables the College of Education to "get the cream of the crop, the best, and the brightest," according to a college administrator. "We have selective enrollment for freshman. We work on retention and we develop a learning community. A variety of learning opportunities carry over to the college and to us. We are selective. The kids are focused."

Occupational studies are a large enterprise. There is a common course in the curriculum that all students take, regardless of specialty area. According to a teacher educator, "We are preparing people who can make a difference in the workforce. Students who leave here have the opportunity to be immersed in professional development opportunities. Like faculty, students get an opportunity to participate in conferences and professional development activities at both the graduate and undergraduate levels. Approximately 100 undergraduate, 200 graduate, and 60 non-degree students are enrolled in CTE programs at the University of Georgia.

Researchers asked a focus group of CTE teachers (program graduates) to describe program characteristics that would cause the university to be identified as having exemplary, leading, and/or or innovative CTE teacher preparation programs. They identified the following: quality faculty, small number of students, lots of interaction with professors, and a stress on experience beyond the walls of the University. Session participants also mentioned that the programs use a variety of rubrics, portfolios, and alternative assessments.

Exemplary Practices

Focus group participants stressed that they got to know their professors. Once the graduates entered the workplace, professors followed up and continued checking on graduates. This professional development follow-up enables the beginning teacher to have "a supportive friend, someone to bounce ideas off of."

According to one focus group participant, programs also encourage a tight bond between undergraduate and graduate students. A stress to be part of collegiate-level organizations also serve prospective teachers well in taking valuable skills from the teacher preparation program to the high school student organizations. Field experiences are also exemplary, a focus group participant noted: "They always encouraged us to visit programs and practices; we had opportunities to see other schools."

People

Faculty in CTE programs are well recognized. As one focus group participant noted, "When you search for a paper, you come up with names of our faculty. Several have received teaching awards, research awards, and numerous other awards from associations."

A teacher in the focus group noted, faculty encourage you to "look at the kids and population, try new things, stand up and believe you are doing the right thing. Be willing to go against the grain." Another teacher commented: "Ideals are clear to us; professors try to innovate, and they serve on advisory boards. They practice what they preach." The teachers in the focus group note seeing professors at conferences. "They don't just stay at collegiate level," says one teacher in the focus group. "They also contribute [professionally] back to the University."

Standards

Outcome standards are emphasized in CTE programs at the University of Georgia, according to teachers in the focus group session. Some CTE professors served on boards to develop standards for teacher education. One teacher noted, "As I was going through my program, I was given copies of standards to incorporate into lesson plans." Another teacher noted, "New Technology Education program standards were just being developed at the national level when I was going through the program. [Concurrently,] the Georgia Quality Core Curriculum was new in technical education."

Rigor

Teachers in the focus group session admired faculty for making their teacher preparation rigorous. As one teacher noted, "When you are finished, you have work you are proud of." Another teacher says, "His professor raises the bar. If we do it at college, you think why can't his students do the same thing in high school?"

Teachers also mentioned their intern experiences, research involvement, community service learning projects, and innovative lesson plans as exemplary learning opportunities. As one teacher noted, "Faculty pushed (us) to work hard, and it has paid off." Faculty are always trying to get students to do a better job.

Modeling Exemplary Teaching

Faculty execute well-planned experiences for students. A teacher in the focus group noted, "One of the classes is project-based; [it is] a manufacturing class, that has little lecture. The class forms groups to run a company with stocks and officers. We have to create, manufacture, and sell a product. It may be a foreign concept to some, and is outside the box of what we [ever] thought of."

Students have guided choices for projects in ways that make them feel as though they have ownership and control. As one teacher noted, "You can limit choices, but [their] project is something [they] want to do. It gives a sense of ownership and destiny. [The concept can also be used] in high school."

Professors also teach a lot in classes, and model the use of rubrics, PowerPoint presentations, and other technology. According to one teacher, "When we model effective teaching, it helps students understand before student teaching and how they're expected to do it." A teacher also commented, "We jump into new technology management. For example, Web CT is used in his class. He has done a good job with it. It is done in the manufacturing process, why not in his class?"

One teacher in the focus group summed it up this way, "They (faculty) encouraged us to be part of research and to try to get back in touch with them after graduation. Faculty members are easily accessible. We have respect for professors when we come here, and we are colleagues when we leave."

Faculty Interviews

Impact of Standards

NCATE and Interstate New Teacher Assessment and Support Consortium (a program of the Council of Chief State School Officers) standards serve as guidelines for many CTE programs. Students also must pass the PRAXIS test. The National Board for Professional Teaching Standards is also considered. Some programs use advisory committees to connect program standards to real-world expectations. Standards related to a contextual teaching and learning grant also influence what is taught in CTE programs. As one CTE teacher educator noted, "We have been involved with a Contextual Teaching and Learning Grant that deals with contextual standards. We have lots of hands-on activities. Most students create portfolios. Portfolios are the standard used in our programs. It would be impossible for you to go into our classrooms and think that we use lecture."

Most CTE faculty members use appropriate technology, such as PowerPoint slides and distance learning, that reflects standards and benchmarks. Some instructors participate in Web-based courses such as Web CT.

Program Rigor

CTE faculty pointed out that their programs compare well regarding rigor, although being successful in a classroom is more important than "rigor," according to some. One faculty member noted, "We are a model. We have one of the largest colleges. We are equal to or better than other teacher education programs. Programs are more [true] to real life. We focus on long-term projects, portfolio assessment, and leadership. This has [all] happened in the last 5 years."

Another CTE faculty member explained it this way, "We are very comparative. We are on par, or exceed, academic programs. We can enhance theory; we tie theory to practice. Academic subjects stop at the theory; we do both. We ask for applications." CTE faculty members benefit from high University admission standards that result in quality students enrolling in CTE programs, and then they maintain those high standards.

An Agricultural Education faculty member offered the following regarding comparison of rigor: "Our requirements are more rigorous than anyone else's. We require adult education instruction, as well as FFA, off-campus and intra-curricular activities. They (prospective teachers) work evenings and weekends with the FFA student organization and Supervised Agricultural Experience Projects."

Classroom Management Preparation

Numerous examples illustrate how CTE faculty prepare prospective teachers to manage the classroom environment. Being realistic, one faculty member noted, "Classroom management is difficult. Each class has its own characteristics. We have lessons on case management. This includes management of a program. They have 2 years in programs, and three practicums." Watching other successful teachers is the best learning method, according to this teacher educator, also emphasizing that, "A calendar of instruction [the curriculum] helps, and is a requirement of our program. If you have clear organization, it makes classroom management easier. This also reduces discipline problems."

Another faculty member indicated, "We do workshops on classroom management 1 day for a couple hours, but most is done via apprentice teaching. They [perspective teachers] find out all they can about their class via records and [create] prescriptions for students needing remedial work. As an apprentice teacher, they learn to discipline students, and to keep students on task." Also, primarily, during the apprentice work the students interact with and learn from guest speakers such as local school district vocational supervisors and teachers, as well as State department of education staff.

For prospective teachers who come from industry, one CTE program addresses classroom management through learning modules with actual classroom management problems. Expert speakers interact with students, and seminars address classroom management issues and emphasize networking.

Knowledgeable Faculty

All faculty members are well-prepared teacher educators from major universities in the country. They make presentations at professional meetings. They share teaching techniques. Most use portfolios, projects, and service learning logs to evaluate students. One faculty member noted, "This is a research institution. There are several experts. A number have taught research. All work on Ph.D. committees."

Another faculty member noted, "When we interviewed and hired our newest faculty member, he had 15 years of high school and 3 years of college work. We want experienced folks to work with us; only faculty with doctorates are allowed to work with our students in Agricultural Education. UGA has a strong requirement to be involved in research to be promoted. Even our new assistant professor has 12 referred publications."

Faculty members have strengths expected at a large land-grant research university. All faculty members interviewed by the project researchers stated that CTE faculty collectively were knowledgeable, or very knowledgeable, in teaching and learning theory, educational content and processes, assessments, and research design and processes.

Model Exemplary Teaching

CTE faculty members emphasized the importance of modeling the best of field-based teaching that they observed from teachers in local schools. Innovation appears commonplace. One teacher educator explained, "They (faculty) are aware of national board standards for teaching preparation. Everyone is using contextual learning, distance learning, Web pages and Web CT courses. We have a lot of support. But we had to get projects to get extra money [for implementing some of the new directions]."

One Agricultural Education teacher educator emphasized a book of 23 teaching techniques that faculty developed. The teacher explained, "Faculty spend a class session examining the main kinds of objectives and domains of learning, and the equipment and facilities to use with the techniques. We have timed micro-teaching that increases (in amount of time) during the semester, and we have a 100-point teaching evaluation instrument, so students have to be good to do well. We review the Georgia Teaching Observation Instrument."

Integrate Academic and CTE

CTE faculty members work with other College of Education faculty to "contextualize" science and math to CTE learning. Some CTE programs use projects that require students to apply the academic subject in the technical education area. Strategies emphasized for school improvement initiatives in public schools by organizations such as the Southern Regional Education Board are explained to CTE students.

Students in CTE are taught to understand why it's important to integrate academic and CTE in preparing their students for the modern workplace, as well as for college. The CTE student organization provides another vehicle to emphasize the integration of academics. Faculty members also emphasize that prospective teachers should do well in the academic courses (e.g., agriculture, business) required in their teacher preparation programs.

Inquiry and Critical Thinking Emphasis

CTE faculty use case studies and problem-based projects or activities to teach inquiry and critical thinking skills. Some programs also require students to complete internships that reinforce inquiry and critical thinking.

One faculty member noted, "In our methods course, we asked students to reflect on things such as why they make decisions; for example, why be a teacher? This is part of the contextual teaching and learning grant." The faculty member maintained it is important for students to know the composition of their communities. Such information influences the practice of teaching. "We discuss how to build lessons that address issues relevant to diversity and [to use] SES issues to emphasize inquiry and critical thinking skills."

Knowledge in Subject Matter

Several CTE faculty members are authors of books in subject areas relevant to the teacher education program. CTE faculty members hold a strong understanding of learning theory, work-based education, and clinical experiences. Faculty may also rely on outside experts to strengthen skills of prospective teachers, such as how to teach reading.

University emphasis on reading the literature, conducting research and publishing results, and participating in national meetings contribute to a faculty highly competent in subject matter. School visitations help teacher educators acquire and apply clinical experience skills.

Use of "Best Practices"

A variety of teaching methods were prevalent when considering "best practices" for effective teaching. As one teacher educator noted, "I don't say there's only one way to do it—I give them [students] a choice. I suggest that they adapt teaching to the learner's style, interests and specialty; take the pragmatic approach. Not every method works with every group. We encourage them to devise [personalized] strategies."

CTE teacher educators also use talented teachers to give prospective teachers an understanding of best practices. In preparing CTE teachers, one teacher educator also "tries to incorporate research that student teachers and others do—especially [research that] relates to learning styles and multiple intelligences."

Diversity

Diversity is a strong focus of the Department and University, says one business-education teacher educator. The requirement is mandated from a multicultural institute in the College of Education. Some CTE programs address cultural and racial differences. Socioeconomic issues are stressed in the context of diversity and teacher effectiveness in CTE programs.

Individual faculty may address diversity in their own unique way. For example, one CTE faculty member has a "diversity day" in the classroom that includes offering "cultural food." In one class assignment, students must use multicultural concepts in a presentation. One graduate-level course on diversity requires case studies and practicums in rural, urban, and suburban schools.

Encourage Professional Development

Students shadow faculty at conferences and other meetings as a way to obtain professional development. Professionalism and professional development are course topics. Students are encouraged to join their respective professional organizations. Students also interact with guest speakers from the teaching ranks and with others who stress the importance of professional development. Lastly, one teacher educator noted, "Students understand that a master's degree is worth an additional $5,000 each year for their entire teaching career." This is an incentive that encourages many students to pursue the master's degree after becoming a teacher.

Update of Course Content

New curriculum guides from the State Department of Education are useful for staying up-to-date in content related to needs of the workplace. Reading the literature, working with graduate students and teachers in the field, and serving on committees inside and outside the institution are viable ways to keep course content up-to-date. One teacher educator suggests that end-of-course evaluations completed by students can provide ideas on connecting course content to workforce needs.

Partnerships

One faculty member suggested developing effective partnerships with local schools, administration, and teachers as means of letting them know they are an important part of the program. She maintained, "Secure and use their input, and work cooperatively with them. Go overboard to work with them—it helps everyone. They are important for us to implementing a contextual teaching and learning model." Being connected to local schools helps this University maintain contact with industry and what is happening in local communities.

Some CTE faculty members conduct projects with teachers as a way to build effective partnerships. Particularly significant are projects that enable teachers to see the value of research, and teacher educators to see the context of practice for doing relevant research. A CTE teacher educator summed up building effective partnerships this way: "There is no magic carpet. It requires a lot of work. There is not enough sharing. We all know we need to improve. We are trying to involve more people. It is a must to contextualize learning projects." Table 3 provides a summary of CTE areas, administration, paths to licensure, and ELI attributes for the University of Georgia.

Table 3
University of Georgia (UGA)

Institution/ Type	CTE Areas	Administration	Paths to Licensure	ELI Attributes
UGA/Public Land Grant	Agriculture	College of Education (Ag and Family and Consumer Science are joint programs with College of Agricultural and Environmental Sciences and College of Family and Consumer Science, respectively.)	BS, Post-Bacc, MEd	Signature Attribute: • Contextual teaching and learning emphasis Distinguishing Attributes: • Cutting-edge philosophy of College of Education • Selective student admissions and scholarship support • Extensive student/faculty interaction • Faculty recognized nationally • Multiple assessment approaches • Well-planned student field experiences • Technology utilization • Research and practice linkage • Faculty model exemplary teaching • Curricula aligned with State and national standards • Highly published and professional faculty
	Business		BS, Post-Bacc, MEd	
	Family and Consumer Science		BS, Post-Bacc, MEd	
	Health Occupations		Alternate Non-Bacc, BS, Post-Bacc	
	Marketing		BS, Post-Bacc, MEd	
	Technology Education		BS, Post-Bacc, MEd	
	Trade–Industry		Alternate Non-Bacc, BS, Post-Bacc	

Summary Site 1: University of Georgia

Teaching and learning in context to the real world is strongly emphasized in the CTE program at the University of Georgia. A multi-year research grant and subsequent pedagogical activities create a philosophical foundation for contextual teaching and learning that permeates the current teacher preparation program. Contextual teaching and learning is the signature attribute that is integrated throughout the undergraduate experience, and is an integral focus of CTE faculty.

Numerous attributes distinguish the CTE programs, including a progressive change-oriented philosophy at the institution and in the College of Education. According to one administrator, "We pride ourselves as implementers of cutting-edge movements. The CTE faculty is nationally recognized for scholarship, teaching, and service." University of Georgia administrators stress a learning community approach within its CTE teacher preparation programs. Quality faculty,

selective admissions, small number of students, a high degree of student interaction with accessible professors, and an emphasis on experience beyond the walls of the university are program attributes noted by CTE teachers who participated in a focus group session.

Faculty, influenced by external advisory boards, keep the CTE program grounded in research and linked to practices in the field. New ideas are shared among faculty who serve as important role models for perspective teachers. CTE faculty members articulate high standards for their students and emphasize use of multiple assessment approaches.

Faculty members emphasize the importance of micro-teaching and of modeling the best of field-based teaching they observe in the local schools. Faculty also use distance education, Web pages and Web CT courses. They also emphasize classroom management preparation done primarily through apprentice teaching, internships, and other field-based experience. Reflective exercises, such as journaling, are an important part of the program. Standards are stressed, and students are responsible for incorporating them into lesson plans.

CTE curricula are aligned with State and national standards. Faculty use case studies and problem-based projects or activities to teach inquiry and critical thinking skills. Best practices focus on applications of different learning styles and multiple intelligences. Faculty members use a variety of ways to keep the course content updated, such as using new curriculum guides from the State Department of Education, reading literature, working with graduate students and teachers in the field, serving on committees inside and outside the institution, and using end-of-course evaluations by students. Technology integration is expected and encouraged. Students are exposed to diversity through their coursework and field experiences. As important, faculty members practice a high level of professionalism, and frequently publish articles that support their approach to and philosophy of CTE at the University of Georgia.

Site 2: University of Minnesota

Program Characteristics

The College of Education and Human Development offers 15 programs that result in a teaching licensure in Minnesota. Another eight special education programs can be either initial or advanced programs. According to an administrator, one reason CTE teacher education programs are particularly innovative is that all teacher education programs in the College are integrated. A Teacher Education Council has worked very hard to identify what core issues or standards all teachers coming from the University of Minnesota need to meet. Consequently, a core set of courses was developed from existing College courses that address these issues. All students, including CTE students, must take those courses, or their college plan must demonstrate how it is fully addressing the issues and standards identified by the Council for teacher education.

"We have been very deliberate, I think, about ensuring that [any] good practice in one of the College's licensure programs is shared with the rest of the preparation programs; [therefore,] innovation is going on," explained the College administrator. For example, one of the standards Minnesota teachers must meet relates to reading in content areas. Agricultural Education faculty members developed some reading modules for their teacher education program. They then shared the modules with the other teacher licensure programs across the college. The

administrator continued, "Another program area will have done something innovative in terms of evaluation; and again, that would be shared across all of the other teacher licensure programs in the College. So I think there is a real shared mission and goal for teacher education."

A department chairperson believes a major characteristic that caused the University of Minnesota to be classified as having an exemplary, leading, and/or innovative CTE teacher preparation program is the adoption of a post-baccalaureate licensure model for all programs. "In my opinion, the students are clearly much more dedicated and committed, because many of them come to us after they have their bachelor's degree and work experience, and say, now I want to be a teacher." The chairperson also pointed out that the strength of the CTE department is that it is quite comprehensive in terms of teacher education programs offered: "At the secondary level, we have Agricultural Education, Business and Marketing Education, Technology Education, Family and Consumer Science Education; and then at the postsecondary level, we have a 2-year Industrial Technology program."

The chairperson continued, "I think we have some very, very dedicated faculty who are involved. I think a reason we can do what we are doing, given what I think is a very limited faculty size, is because we are in an urban area. We can tap several people, either teachers or former graduate students, who can come in and help us in the teacher education programs. We have wonderful, wonderful people who come in and teach a session." According to this administrator, it all comes down to the most important element in the programs—the faculty. "Our faculty are so committed, and then we are fortunate to get wonderful students. Lots of people want to come to the University of Minnesota and live in the area, partly because it is the most prestigious place to go to college in Minnesota." The College administrator also points out that one advantage could be that these programs are not duplicated in many areas across the state. But a few others do have several programs that fall under the Career and Technical Education umbrella.

Work with cooperating teachers and with other professionals in the preservice program, and inservice, is very important. Workshops for cooperating teachers and supervising teachers exist in many of the programs. Along with faculty, graduate students or other professionals serve as supervisors who evaluate students on-site during student teaching. There are a lot of visits and varying perspectives on the students' performance in the classroom. "This brings those individuals together in workshops to be sure that, again, we are all looking at the same things, that we've got the same thoughts in mind, and that there is a set of standards that we are trying to help people meet. It is a very difficult thing to continue to do because of the large number of students we have," said the administrator.

In the focus group interviews, former graduates of the CTE programs were eager to point out their reasons why the CTE teacher education programs at the University of Minnesota would be among the most exemplary and innovative in the country.

A graduate student in the Agriculture, Food, and Environmental Education program reinforced what a College administrator highlighted about the collaboration among various disciplines at the University of Minnesota. "The University of Minnesota has a Council on Teacher Ed that takes professors from different disciplines, and they collaborate on changes that need to be made and that collaboration overall adds to the quality of education across the board." A Business Education graduate said, "I actually interviewed tax professionals for my job, and we felt that this institution had better content experts than some of the private institutions. The education that was being taught here was very good, and that prompted me to come here."

A graduate of the Family Education program pointed out that, "In my program, they are going against the grain a little bit. The program challenges us in the traditional role and the situation just encourages us to change, it's just different, the actual content is different from the private institutions." A graduate student in Business Education emphasized the high quality of faculty: "The quality of the instructors that I experienced through my prerequisite year and licensure year were exceptional. I had instructors who were leaders in their field, who lead research in their content areas, who wrote the texts that the classes used—just really extraordinary people." An Agriculture, Food and Environmental Education graduate added, "I think also the fact that the professors and advisors are very student-centered and willing to go beyond the call of duty to help their students is exemplary." The foundations classes that education students participate in are very unique compared to other programs. They give students a broad spectrum of everything from technology to educational psychology to human relations. "So we get a very good broad background of educational aspects, above and beyond our technical background," explained the CTE program graduate.

One focus group participant, who started out in industry, taught in a high school for 5 years, then came to the University for a master's degree in Business Education, complimented connections to the student teaching experience as the strongest asset of the program. Of note: "The strongest is the combination of the theory given at the University and the practical application during the student teaching experience. The student teaching experience is tremendous. They have great cooperative teachers and individuals who serve as examples. They have supervisors at the University who are very involved in the process, so that over an entire year you gain so much experience that really helps you be a more effective teacher when you get out of the program."

A Family and Consumer Science teacher added, "I found the year-long experience highly valuable. We don't do our full-time student teaching until spring. You are in the school from fall to spring, so you get to see what happens all through the school year, and then come back and talk to the people in your cohort." This graduate emphasized the relationships and networking from "knowing your supervisor" and connecting to the cohort. Students work with a group of students and go through the program together, sharing and rejoicing together: "That is what is really wonderful—the support systems you have as you go through the program."

A second-year Business-Marketing Education teacher reinforces the strength of faculty in the CTE teacher education programs. "Faculty is set up where each individual has certain strengths that they [the students] see in different classes. Some faculty members are very strong in theory. Other faculty members have first-hand experience in the classroom. So you get very different points from each of the professors, and they really intertwine nicely." This graduate suggested the way the overall program is set up is very friendly to people coming from industry where you have to put a substantial amount of time in but you can kind of pick your schedule. Faculty keep the students in mind. They do a good job keeping class sizes and the cohorts to a reasonable level, wherein students can take advantage of the group interaction and feel a part of the group. "That was a really nice aspect of my cohort. The small group was like a family," said the focus group participant.

How faculty treat graduates of the program also makes the program exemplary, according to focus group participants. "After completing the program you do not feel that you are a number; the people still know you on a personal basis, and you know everybody," said a former student. "That really makes you part of something, when you come back and they know your first name. They really make sure they get to know you as an individual, and that's huge."

Another former student agreed, "This is the kind of place that, when I come back, I have some [specific people] to speak with and that's very special. You really know the professors, and they say 'Hi' to you in the hallway and remember who you are, and they are excited to hear about events in your family, and that sort of thing. So that is a kind of personal relationship. It is definitely part of what makes this place special."

Focus group participants frequently characterized the CTE programs as individualized, personalized, and well-connected to the public schools. All students are welcome; there is diversity of population in age and race. Faculty members help you do your best. As a focus group participant noted, "CTE programs have well-educated, very dedicated, and highly prized professors."

Exemplary Practices

Focus group participants were also asked to specify practices of the University or their department that they would consider as exemplary, leading, and/or innovative. Several program practices are noteworthy, according to focus group participants. For example, in Agricultural Education, students must complete a set of 24 teaching modules. They are also licensed to teach in the middle schools. In the business education class, students must go out into three classrooms for observation. Emphasis is on the practical aspects of being a teacher. Prospective teachers observe and report on what the students do right and what could be improved.

A teacher of agriculture and finance management for 18 years, one former student noted the principles associated with the problem-solving approach to teaching learned at the University were "suitable for [my] entire career. Literally everywhere I went, all over the world in professional settings, you identified your objectives, made problem-solving statements, and used those things that get *kids* interested, [such as] making sure you touch base with everyone in the classroom. That type of curriculum has been recognized nationally in a number of situations as an approach that works in the process of teaching."

Keeping a journal in the year-long cohort experience was "really powerful," according to one focus group participant. "Looking back on that now, [it] is powerful to read some of your reactions to being in the classroom for the first time." Another participant experienced the sense of building community, a lifelong relationship with colleagues, as an exemplary practice associated with the cohort experience. The teacher explained, "Many years passed, and they [students] are still keeping in touch with one another. That builds a sense of professional community. I think the practice of building cohorts, and also of linking one cohort with the next in a sort of celebratory way, makes a real difference."

Participants also stressed the department is not an island unto itself. It is a part of the greater faculty and College of Education, which is very broad. A focus group participant who earned a Ph.D. in vocational teacher education in the CTE department noted, "Everybody in the College is interested in a teacher's education, and they come together to work through issues. We just finished developing a cross-form assessment, making it a whole-College dialogue. So there is consistency in the College and across programs. There is vitality and energy among people throughout the College who are interested in teacher education. These practices are not done solely as the CTE Department of Education, but also as part of the College of Education."

People

Focus group participants were asked to explain how the people at the University contribute to the ideas of exemplary, leading, and/or innovative CTE teacher preparation. Responses indicate the professors are excited about their jobs and make class interesting. They challenge students in class, and challenge each other to push beyond the current level of achievement. Faculty practice conducting evaluations and changing to improve the program. Experienced professors nurture new faculty and help them improve. Faculty members also help students establish goals and find their potential, modeling for their students and networking along the way. Supported by the research mission of a land-grant university, faculty members bring research into class and curriculum. As a graduate student in Agricultural Education pointed out, "We're being taught what's currently available and what's current in the field. We're challenged time and time again in lots of courses to think outside the box about what's going to happen 10–15 years from now in technical education. How can we make that a viable part of high schools in the future?"

Standards

Focus group participants were asked to explain how outcomes or standards are emphasized in the CTE program. "Standards used to be on factual information. Now they are on thinking," said a focus group participant. Another participant revealed, "We create a portfolio in Ag Ed in the fall of our senior year that outlines all our graduation standards, and details of how we meet those standards." A former student pointed out, "We are required to take many credits in a lot of different areas—not only the teacher prep side, but also the background knowledge—that give us the background to teach,"

Another focus group participant said, "All courses and programs are aligned to standards. Faculty have worked very hard to integrate those into our courses. Courses go above and beyond the standards that the State [requires]. It is a whole process in itself, and reflected in every course, every assignment, and every activity where students in teacher preparation are involved."

Rigor

Focus group participants were asked to explain how program rigor contributes to teacher preparation programs at the University. Because the teacher education program is at the master's degree level, one focus group participant said, "The majority of work in education is going to be in a report format. So, there is assignment and subjectivity to it. You expect to think critically, and thoroughly analyze as if you were writing poetry." That experience, the participant revealed, "is a lot more meaningful than a lot of work you do during the undergraduate program, where you do mostly objectives tasks. This allows you to expand your mind and puts you in a position that once in a while you really scratch your head and sit down staring in front of the computer, thinking and thinking, but eventually you get something written down. That style of teaching is much more effective than the old standard paper-and-pencil objective-type testing."

There is too much work to do in the program, according to one focus group participant. "Some people thought they could [also] have a job, and then they found they couldn't do this at the same time, and then they quit their jobs. You are meeting and working in projects every night, and you are completely immersed in the process. It was exciting, and it prepares you also for being a teacher that first year. You really need to take classes while you are a student-teacher because a full-time commitment is very rigorous." CTE programs help students project goals and achieve them in a dynamic and competent way. The University maintains a high expectation of rigorous programs throughout the institution.

Modeling Exemplary Teaching

Focus group participants also were asked to share their views regarding how CTE faculty modeled exemplary teaching. Simply put, one focus group member, currently a 2nd-year teacher who worked in business for 3 years and recently completed a master's in Business Marketing Education, said, "They are very human. They understand the rigor you go through and the sacrifices that you are making. Professors are very clear and work together with us. The work atmosphere is very comfortable, and makes you understand what you are going to do as a teacher."

How the faculty confronts the challenge of change exemplifies excellence, according to one focus group participant who completed a Ph.D. in vocational teacher education in the Department. "I was a brand new grad student at the time, and I watched the family education faculty courageously take the program and throw it out and begin from scratch—discussing what kind of teachers they wanted to produce in their teacher education program. They are willing to take moments of opportunity and challenge themselves to ask how we make the program better. I also watched the College faculty doing the same. We were asked by the Council on Teaching to provide assurance they taught to the Minnesota standards. They took that as an opportunity to work with the programs, to find out what we were doing quite well, and then working to exceed those expectations."

Faculty members also draw upon experiences as former teachers in the public schools. As one focus group participant noted, "The CTE professors frequently talk about their own experiences. They integrate their experiences with problems you are working on or discussing. So you know they've been in that situation; you know how they handled it. You don't have to

handle it exactly the same way, but you know they have been through it all. They model research. In most courses, they have numerous articles for us to read relating to the subject they're teaching. It makes a difference. They want to show us that research in their areas is important." Most faculty members in CTE programs do considerable research and writing on important teacher education issues.

Faculty Interviews

Impact of Standards

Preparation of CTE teachers in agricultural education at the University of Minnesota has transitioned from a course-based program to a standards-based program, according to one faculty member. Curriculum was the first area addressed. The changes were made in order to guarantee that students met the new State standards. The final assessment for the student teaching experience is also based on a standards-based assessment instrument. In the final year of preparation, students also create a portfolio around the standards. It serves as another piece of evidence that the students have met the standards.

Faculty in the technology education program have created a new Bachelor of Science degree program that is an alternative to the post-baccalaureate master's program. In creating the program, both State standards and standards set by the International Technology Education Association guided program development. Faculty in the Family Life Education program also pay close attention to national standards in their professional association of Family and Consumer Science, the American Association of Family and Consumer Sciences (AAFCS). Because the program is not intended to prepare students for an occupation (program believes community college can do this), the standards are geared to preparing students for family life. For example, a faculty member noted, "Parent education from our department is a unique program in the United States."

Business education and marketing education no longer exist in Minnesota. As of July 2001, students follow a curriculum in business and obtain a "business license" to teach. "If you want to run the co-op component of what used to be marketing education, you get a second license for 'coordinators of vocational organizations,'" said a faculty member. Also new in 2001—there is no categorical funding for vocational subject areas. "That will have a profound impact over time on high school vocational programs," said one faculty member. "The other thing you should know is that we have a much stronger postsecondary system of vocational education than what you might find elsewhere." This implies that much of the "vocational-technical" training in Minnesota was a responsibility of the postsecondary system.

Three faculty members summed up the standards and licensure issue in their business licensure programs: "When you talk about licensure in the teacher education programs, one of the things you'll have to accommodate is that we have now moved to a different model—a different set of licenses that will cause us to change how we do what we do. We went through another phase where we went to the post-baccalaureate model back in the late 1980s. It took us out of the undergraduate teacher preparation arena, and completely into business and marketing." State standards guide licensure for teachers in business, and the teacher education program was developed directly in line with the State's requirements. "Our curriculum is all of the [state]

content matter. The students either have to have a degree including all the content matter or they have to go back and show successful completion of coursework," said one faculty member.

Program Rigor

Rigor seems implied in teacher education programs because the University of Minnesota is a Holmes Group institution, where most CTE students, with a couple of exceptions, must come into the teacher preparation program with a baccalaureate degree in a content area. "Rigor comparisons is a tough question to answer," said one business faculty member. "There's a built-in bias. Those who teach math probably have to deal a lot more with cognitive thought matter, and if you're going to be teaching physics, one could argue that's much more rigorous than teaching keyboarding. I think of rigor in the context of what we're asking them [the students] to learn and to teach, and would argue that the courses are very rigorous. You're required to know a broader spectrum of content. There might be 23 courses in a high school business program, for example. The other thing is, in our methods classes, they do go through not only teaching technology, but when it is best to teach technology, what some of the disadvantages are, and even technology use in writing courses."

Agricultural education faculty point out that almost all of the majors in the College of Agriculture, where the Agricultural Education program is administered, requires a 2.0 grade point average for entry, and 2.0 for graduation. In Agricultural Education, you need a 2.8. "We instituted that some time ago, to keep up with the College of Education, which doesn't admit people unless they have about a 2.8. So that does put some pressure on us in terms of academic situations." As a faculty member of the family life program noted, "We were the first to go to a 5th-year program, about 13 or 14 years ago. We screen on GPA, prerequisites, an interview, and program visits."

Classroom Management Preparation

In the Family Life Program, two semester-long courses plus two semester-long seminars, a year of internship (August through June), and use of the case study approach in classes prepare prospective teachers for managing the classroom environment. A 1-year internship assists assimilation of class learning.

Emphasis on the early field-based experience is key for students in the business licensure program. "We really start in the pre-fall seminar, where the students are expected to observe the pre-fall workshop with their cooperating teachers," said a business faculty member. "They're (also) expected to observe the 1st week of school—most importantly the first 2 days. I want them to see what that teacher does to establish rapport for the whole year. Then, during fall semester, they observe 120 hours in their school; they're asked to observe a variety of teachers in the business and marketing department as many times as possible. Then, they're to communicate with their cooperating teacher which teachers in the school have a reputation for having good classroom management. They also have to enter it into their journal, and they have to reflect on it in a seminar (back at the University, in class)."

In the Agricultural Education program, prospective teachers have a chance to contrast student behavior in a wide range of settings. In the senior-year fall, students earn 2 credits for student teaching. Faculty expect each student to be in schools about 2–3 hours per week while in the

course. A weekly seminar session is also associated with the student teaching course. As a faculty member noted, "The basic thought of this course is to teach discipline and classroom management kinds of things. Then, our students go out and they get to see it. Then, after we have done our student teaching and so forth in our methods course in the fall, they have a chance to practice a bit."

A relationship with one of the Minneapolis middle schools, Chiron Middle School, enables prospective agriculture teachers to see an urban teaching environment. "We've teamed up with their science teachers for about 12–13 years now," said an Ag Ed teacher educator. "The middle school students come to campus, and we work on some experiments from an agricultural context. A high percentage of the students come from urban, single-parent situations. Some come from shelters. Our prospective teachers can experience almost anything. They get that experience in the fall, and then in the spring go full-time as a student teacher into other parts of the State (usually rural)."

Knowledgeable Faculty

The Council on Teacher Education at the University of Minnesota encourages faculty to interact and share in ways that make each of them stronger. CTE faculty know the courses and skills offered by one another and by other faculty in education. Collectively, faculty knowledge is considerable in teaching and learning, educational content and processes, assessments, and research design and processes. Unique expertise can be found among faculty at this large land-grant research university.

Model Exemplary Teaching

A business licensure faculty member credited "a core of schools and cooperating teachers that are better than exemplary," when asked how they model exemplary teaching or prospective business (and marketing) teachers. "We hand-pick our cooperating teachers, and I think the reason we are so fortunate to be in a situation like that is because I was a business and marketing education instructor, so I know a lot of them and I know a lot about them." The faculty member continued, "We have someone at the University of Minnesota who does job placement for the department, but I think when you have a good, sound core of exemplary, or better than exemplary, cooperating teachers and schools, the program is going to work. Keeping very positive relations with cooperating teachers continually is extremely important. Because, if we didn't have them, we wouldn't have a program. So we feel they are very precious to us, and we treat them with respect—very, very kindly."

In some instances, the College and the University as a whole have recognized a CTE faculty member for exemplary teaching. One faculty member mentioned their own membership in the University of Minnesota's Academy of Distinguished Teachers. Faculty attempt to present students with example teaching lessons that match the reality of the needs they will have when entering the classroom as a beginning teacher. Also, in the Agricultural Education program, only professors—no graduate assistants—teach courses.

Integrate Academic and CTE

CTE faculty members employ a variety of approaches to integrate academic and technical education. Agricultural Education faculty use a teaming approach with science and other teachers to make the connection between the academic subject and applications to the agricultural context. A CTE business faculty member noted, "You tell your prospective teachers in the methods class that occasionally you may have to be a math teacher, you may have to be an English teacher, and you may have to teach a little writing—those kinds of things that are usually thought to be academic subjects."

Conducting research that brings the academic and technical teachers together also appears helpful in breaking down barriers to productive collaboration between academic and technical teachers. According to a technology education faculty member, "Technology education is premised on academics." "Integration occurs naturally in our program, [although] we may not discuss it," said a Family Life faculty member. "We expect students to teach everyday life and everything involved in family education. We expect scholarly work, and we are academically oriented."

Inquiry and Critical Thinking Emphasis

Agricultural Educational faculty point out that what is called "constructivism" today was the "problem solving approach" that has been long taught by effective Agricultural Education teachers in methods courses. For instance, connecting the problem solving approach to Bloom's Taxonomy and the scientific method is the cornerstone of good methods for teaching agriculture. Business faculty suggest raising issues that require students to reflect and find information for themselves. It works to foster critical thinking skills. Pushing students to the metacognition level with an emphasis on inquiry is a common practice in the Technology Education program.

Knowledge in Subject Matter

CTE faculty believe guiding clinical experiences and teaching prospective teachers through "real life" examples requires a high level of expertise in learning theory. Several faculty members have taught a course on work-based learning that is available to all CTE students. As one faculty member noted, "there is distributed knowledge across the department." Faculty perceive a high level of expertise among the CTE staff at the University. Some tension exists between Family and Consumer Science and other CTE perspectives, as the curriculum for Family Life Education is comprehensive, but not career-based, as other CTE areas are. Thus, the subject matter commonly related to CTE philosophy is not the same for the Family Life students.

Use of "Best Practices"

Faculty emphasize strategies that work in the real world in classroom or laboratory settings and consider access to such orientations a priority. For example, in Agricultural Education, faculty make a special effort to take summer courses *to* teachers. As one faculty member noted, "We no longer have courses on campus in the summer. We take all of our summer courses out to our teachers across the State. I just did a little tour this summer. We spent 3 days. I rented a bus and tried to find schools that we saw doing quality things. So I'd like to think that we are plugged into where the good practices are."

Technology Education faculty emphasize a fundamental principles approach. Methods instruction is based on core concepts, learning theory, and fundamental principles that are based on what is known, how to organize long-term memory, and use of concept maps. As a faculty member noted, "It is not necessarily the best practices approach, but a best practices approach has to be one that is premised on what is working and long-term experience."

Diversity

"We're 90% white in Minnesota, except in our two major urban areas. The College of Education has a major emphasis on diversity and has partnerships with both Minneapolis and St. Paul." Diversity is addressed in recruitment practices and in the curriculum. "Students get it through their experiences here," said one CTE faculty member. "And if they don't have a (diverse) situation in their school, then they have to communicate with their cohort and find a situation that they can go observe. Students observe, reflect, and talk about it (diversity) at great length."

Encourage Professional Development

Because students come to the teacher education program with a bachelor's degree, "they are used to going to conferences and being in professional organizations," said one CTE business faculty member. In courses and seminars, prospective teachers are introduced to various professional organizations. Close partnerships exist between some CTE teacher education programs and the teachers' professional organizations. For example, in Agricultural Education, "We design our summers together so that the summer Ag Teachers conference is on Tuesdays and Thursdays, and we offer professional development Ag Ed courses on Monday, Thursday, and Friday," said one faculty member. "We work together with them [teachers in the State Ag teacher's association] as a team, to address their needs."

A Family Life teacher educator responded, "We try to encourage professional activity for our students, and we have scholarships for professional development. We model professional development through our professional associations."

Update of Course Content

CTE faculty members are active in their respective fields. This means the curriculum is updated naturally, as part of an ongoing process. As one CTE faculty member noted, "It [updating] is really because of the professional activity of the faculty, and by faculty I mean all of those who are teaching courses, who bring in the latest because they're active in their fields. This is not by design, but more by default. We keep changing our programs, and we're getting ready to do it again. When you're doing this through faculty meetings, you have the input of everyone; everybody's different specialty area can add to the update of content, so that the people who are developing the courses, changing the content, also have resources to draw upon."

Technology also plays a major role, according to one Ag Ed teacher educator. "By using CDs wherever we can, our students have access to the latest things that are out there. I cannot think of anything worse for us as a teacher education program than asking our students to put together lesson plans that are out-of-date. Of course, I also think the Internet now has given us an opportunity, so the students can just plug in and get up-to-date information." Also, in

Technology Education, the course content is not totally driven by the workplace. Underlying principles of technology are the drivers in keeping the program consistent and current.

Partnerships

CTE teacher education programs have a variety of approaches to partnerships with schools, administrators, and teachers. For example, in the Technology Education program, a professional development grant enables the program to work with school districts. As a faculty member noted, "One reason we send students out to partnerships is to cultivate [even broader] relationships with the partners."

Business licensure faculty emphasize that contact is the key to good partnerships. "Many of our supervision teachers out there are graduates of the program, so it's kind of an alumni network that has been built over the years. It feeds itself. We get this growing network, and as a consequence you have these on-going relationships, that started when prospective teachers were here in the teacher education program as students. And that's the best of all worlds."

An Ag Ed faculty member also stressed the importance of "getting out there." A full-time recruiter is hired to go to schools across the State. "Last week, that person was out in 7 or 8 high schools across the State. This coming week, the number will be 10 or 12. It has been kind of a neat experience to just get out there. I think now teachers can no longer say 'hey, we haven't seen anybody from the U of M for a long time,' because we are trying to be out there all the time." At the same time, the Ag Ed faculty maintain their strong partnership with the State Ag Teachers' Association. Table 4 provides a summary of CTE areas, administration, paths to licensure, and ELI attributes for the University of Minnesota.

Table 4
University of Minnesota (UMN)

Institution/ Type	CTE Areas	Administration	Paths to Licensure	ELI Attributes
UMN/Public Land Grant	Agriculture	College of Education and Human Development (the official licensing agent for all licensure areas).	BS, Post-Bacc	Signature Attribute: • Cohort field experience Distinguishing Attributes: • University-respected faculty • Active, supportive Teacher Education Council in College • Faculty sharing across teacher licensing programs • Post-baccalaureate licensure model • Highly educated and committed faculty • Small class, personal relationship approach • Strong partner relationships with cooperating teachers and professional organizations in State • Concentration of CTE programs at University • Research and practice linkage • Curricula aligned with State standards • Access to quality class presenters in urban University locations
	Business & Marketing Ed		Post-Bacc	
	Technology Education		BS, Post-Bacc	
	Health Occupations		BS, Alternate Non-Degree	
	Industrial Technology		BS, Post-acc	

Summary Site 2: University of Minnesota

The signature attribute that reveals the innovative approach of CTE teacher education programs at the University of Minnesota is that students believe they are well-prepared, and many of their professional relationships begin during the cohort-based field experiences. As one focus group participant stressed, "Students work with a group of students and go through it [the cohort] together, sharing and rejoicing together." Another graduate emphasized, "What is really wonderful is the support systems you have as you go through the program. Faculty members keep the students in mind. They do a good job keeping class sizes and the cohorts to a reasonable level, so that students can take advantage of the group interaction and feel a part of the group." Students see the cohort experience as making a real difference. It builds lifelong relationships with colleagues—a sense of professional community that links one cohort with the next in a celebratory way.

Also, the University of Minnesota has an active teacher education council that identifies core issues and standards for the students. The CTE faculty is respected, and all faculties in teacher licensing programs share a mission and a goal for teacher education that leverages resources of the urban area. Students have the opportunity to experience academic integration through a campus lab school. CTE programs are concentrated at the University of Minnesota, rather than being offered at numerous institutions of higher education throughout the State. "Minnesota has a stronger postsecondary system of vocational education than what you might find elsewhere," said one teacher educator. In fact, much of the so-called "vocational-technical" training in Minnesota is the responsibility of the postsecondary system.

Admission standards have been raised. CTE teacher preparation programs have adopted a post-baccalaureate model for all programs. As one administrator stated, "The students are clearly much more dedicated and committed because many of them enter the program after they have their bachelor's degrees and work experience." A problem-solving approach and reflective practice are stressed. Students must know how to use technology, and research is linked to the practical aspects of being a teacher. A highly educated and committed faculty works in small-class environments to offer students a curriculum that is aligned with State and national standards.

Faculty members bring their long-term experiences and personal interests in students into the classroom, model exemplary teaching, and otherwise help students understand teaching. Faculty members maintain key connections to professional organizations, and funds are available to encourage students to attend conferences. Summer courses are taken out to teachers in the State. Faculty members have considerable contact with school districts in the area, and consider the cooperating teachers as key partners in the teacher preparation program. As one teacher educator noted, "We hand-pick our cooperating teachers, and treat them very kindly."

Site 3: The Ohio State University

Program Characteristics

Career and Technical Education has a long and nationally recognized history at The Ohio State University (OSU). Numerous sources rate this CTE institution as the number-one graduate program in the country. Programs are administered in three separate colleges at this large, comprehensive, public land-grant university with over 50,000 undergraduate and graduate students. CTE programs operate in the College of Education, the College of Food, Agricultural, and Environmental Sciences, and the College of Human Ecology.

College administrators offer several characteristics that they believe caused the institution to be identified as having exemplary, leading, and/or innovative CTE teacher preparation programs. One is the faculty and departments, such as Agricultural Education, with national reputations in research and influence on the discipline of CTE. A second reason is the previous graduates, particularly those who earned their Ph.D. in CTE programs, now are in important positions around the country, including positions as teacher educators in CTE disciplines.

A third reason noted by college administrators is the attention and influence earned and enjoyed by the original National Center for Research in Vocational Education, located at OSU for 20 years. OSU also serves as the site of the National Center for Dissemination for Career and Technology Education. A fourth reason is that OSU is also home to the ERIC Clearinghouse on Adult, Career, and Vocational Education—one of the 16 national Educational Resources Information Center (ERIC) clearinghouses for education in the United States. Collectively, these characteristics offer a capacity and reputation unparalleled at other universities, according to administrators interviewed in this study. The College of Education also operates the Center on Education and Training for Employment (CETE).

Graduates of the CTE programs also acknowledge numerous other characteristics they believe led to the selection of OSU as having exemplary, leading, and/or innovative CTE teacher preparation programs. Former CTE students frequently mention the dedication of professors with national reputations who are "tireless, student-centered, and broad-minded." As one former student noted, "Many of the CTE professors are like coaches with a personal touch." Other former students noted that connections to the Ohio Department of Education have been valuable. One former student also acknowledged the high commitment the CTE program has had to serving teachers in correctional institutions as illustrative of the institution's commitment to addressing needs of individuals and the workforce.

Exemplary Practices

College administrators suggest the philosophical and financial commitments for CTE programs have been strong. Good leadership and decentralized authority have served programs well. A commitment to be among the best in the country guides actions that have resulted in excellent faculty hires at OSU. Interdisciplinary efforts are encouraged at the institution. One administrator also noted, "The University policy on outreach, engagement, and the redefinition of scholarship as it relates to promotion and tenure is an outgrowth of Ernest Boyer's book, *Scholarship Redefined*, which had an impact on us, making promotion and tenure broader than

research." OSU also financially rewards both the individual and the department when a faculty member receives an outstanding teaching recognition by the University.

According to an administrator, "The Ohio Department of Education provides funds that are divided among the three colleges, which University policy allows to happen." The academic CTE programs are linked to the national CTE centers located here. Such linkage is particularly valuable for supporting research and other activities of faculty and graduate students.

A new "responsibility-based budgeting" model at OSU offers the potential for department faculty who want to excel at attracting funds. This cost-basis budgeting also will not reward weak or ineffective programs. Colleges will be given a budget based on what it earns and what it actually costs to operate programs. Administrators speculated that this budget model will also stimulate additional innovation in CTE programs.

Moreover, colleges that house CTE programs are changing rapidly, as illustrated by changes in the name of the College and departments within the College of Food, Agricultural, and Environmental Sciences. A new integrated systems approach, illustrated in a four-sided pyramid that places more emphasis on social responsibility and environmental compatibility, will change the way the College does business. There is more emphasis on the rural-urban interface—an issue that will influence the faculty and curriculum of all students choosing to major in Agricultural Education, now administered in a new department called Human and Community Resource Development.

Graduates of the different colleges that administer CTE programs at OSU are noticing these sorts of changes. Graduates of the CTE programs note their programs give a feeling of "always being on the cutting edge." High expectation levels for student performance are prevalent, and what is learned in class is relevant to the real world of teaching found in the public schools. As one program graduate noted, "Many CTE faculty actually go to (school) sites to observe what is going on—a characteristic not true among other faculty members."

Focus group participants note that faculty are available to students: "They teach you to write, and help you with issues such as teacher certification. Faculty members also direct students to innovative research results, know how to use them, are greatly aware of resources, and emphasize problem solving and critical thinking. A professional approach to college teaching is an important aspect of role modeling at OSU. Our professors and program coordinators are constantly looking toward what they can provide for us in the future, and national board certification is one way they can guide us." Another graduate student commented, "They are always pressing for national certification. They want us to be nationally certified. I have a lot of friends who went into education from other universities, and they don't even know what certification is."

Professors instill in students that their education is ongoing. As a student pointed out, "When you are finished, you are not done. The big emphasis on continuing your education and research helps the people when they come out to be strong. Professors worked with us as colleagues. They used tons of cooperative learning and problem-solving methods. To help students how to critically think is innovative in itself."

Another student commented, "We were taught how to write rationales—and to support why we were doing what we were doing. So if we are ever questioned, we have the background to respond with what the research says."

People

Both administrators of colleges and former CTE students applauded faculty as the people who give quality to the CTE programs. A tremendous amount of respect is associated with the national reputations of faculty. One focus group participant pointed out, "Faculty push people forward in a way that makes a difference. They believe in continuous learning and integration of technology."

Focus group participants also pointed out that faculty members are a hub for making connections to professional organizations. One former student noted, "Faculty always keep you updated on what professional organizations and the Ohio Department of Education are doing." Another former student mentioned, "Faculty help you understand research in the field. Faculty were cautious in what they gave us to use. They took time to evaluate text or resource recommendations prior to giving them to us. This allowed us to receive the best quality material," said another focus group participant.

Standards

Rapidly changing CTE standards generates a lot of class discussion. One former student pointed out, "Faculty and students have drafted suggested changes in CTE and sent them to the Ohio Department of Education." Focus group participants note that outcome standards are emphasized in the curriculum and in lesson plans, and integrated into academic outcomes and objectives.

Participants indicate proficiency tests have been around in vocational education for the past 20 years in Ohio as a task/outcome-based platform. In the mid '80s, prior to the Occupancy Competency Assessment Profiles (OCAPs), other competency profiles and related assessments existed. Main curriculum standards follow national standards. Ohio now requires the Integrated Technical and Academic Competencies (ICAPs) in the CTE curriculum.

Rigor

According to focus group participants, CTE programs are very "intense." One focus group participant recalled student teaching this way: "When I started teaching, it was always rigorous, with a lot of demands. I needed to create daily lesson plans and back them up with research." Another participant noted, "In addition to academics, there was great involvement in public school classrooms. A requirement of my program was that I spend 75 hours a quarter in a school, observing teaching practices, etc."

The rigor in the programs helps you "constantly be on top of everything," said one focus group participant. "It helps you solve problems in the classroom when you start teaching, and helps you be more confident dealing with problems." Connecting research results to the undergraduate classroom experience is a pervasive part of the rigor in CTE disciplines at OSU.

One former graduate who now serves as a CTE administrator in a career center was quick to point out the reality of working in CTE today: "This is a tough profession. Reform is all around us. There are high expectations today for teachers and students not prevalent in 'old world' vocational education. Today, career preparation means students also must be prepared to go to college, not just to the workplace after graduation from the CTE program." The administrator added: "Among the innovations needed today are how to bring academics into CTE programs, how CTE and academic teachers can work together in 'teaming' activities, how to better use 'project teaching,' and how to implement CTE into 'block scheduling' approaches in public schools. Lastly, new instructional strategies are needed in CTE that embrace the use of technology to meet the different kind of students we have in the schools today."

Modeling Exemplary Teaching

Focus group participants pointed out what makes CTE faculty members exemplary. They indicated faculty members strive to meet the needs of students in a personal-relationship way. They practice good teaching methods and encourage their students to do the same. According to one focus group participant, "Professionalism is very important to them. Our professors dress as professionals."

"Exemplary professors show different models and ways to be good teachers other than lecturing," said one participant. Another added, "Most professors also have been involved in professional organizations. They communicate with other professionals through lots of networking, addressing current issues and topics. They have lots of curriculum resources that help you be very prepared when you go into the field," said one former CTE student. "They are good 'facilitators' of learning," added a current teacher and former CTE graduate.

Lastly, a strong work ethic seems to persist in exemplary faculty. As one former graduate of the Agricultural Education program noted, "Their tradition, their culture, their history in Ag Ed is so obvious. If they could just teach their work ethic to future students, we would be a world ahead of other programs. They practice what they preach. They demonstrate the way to do it [are exemplary teachers]."

Faculty Interviews

Impact of Standards

Most CTE faculty directly involved with teacher preparation acknowledge efforts are either completed or underway to align the curriculum with required or recommended sets of standards. For example, one teacher educator in technology education indicated, "We are reviewing new standards for technology education now. Our Teacher Education Council, which is a council on technology teacher education and a leg of the International Technology Education Association, is reviewing the new standards. They're looking at our curriculum to determine how we might infuse those standards into each of the areas of our curriculum."

A teacher educator in Agricultural Education remarked, "We have redesigned the technical and pedagogical portions of the Agricultural Education curriculum to be responsive to the Interstate New Teacher Assessment and Support Consortium (INTASC). Also, we aligned program standards with those of the Professional Assessments for Beginning Teachers

(PRAXIS), the American Association for Agricultural Education (AAAE), and the National Board of Professional Teacher Standards (NBPTS) standards."

Another teacher educator said, "Where pedagogy is concerned, I think I would have to go with the PRAXIS standards. We have revamped everything we do with field-based preparation and testing of our students prior to their entering professional standing as juniors and seniors. And the test [at OSU] is modeled after the PRAXIS exam. Our observation of student teachers in their student teaching experience is all based on rubrics that we derived from PRAXIS." Also under great transition, faculty members of the Family and Consumer Science program have proposed standards for a new program in line with those recommended by the national association.

For some CTE programs, changes are more a reflection of College-wide initiatives. For example, a teacher educator in the College of Education noted, "The standards have had very little impact on technology, but our College and University initiatives had a dramatic effect. It is in the form of Web-based course delivery and using more instructional technology in our courses." The teacher educator added, "Students have been involved in more computer-based activities in their classes, utilizing audio and video and the combination of the two in delivering instructional materials. We are also adding an alternative to the Holmes Group master's degree model for teacher licensure in math, science, and technology education principally because we don't have a complementary undergraduate degree in engineering at Ohio State."

Program Rigor

Faculty mentioned that the master's degree Holmes Group model has added rigor to CTE programs in the College of Education. As CTE programs are reviewed, faculty have compared proposed changes to other teacher education programs, to ensure adequate rigor. One business education faculty member noted, "It is extremely rigorous, there is no wiggle room, every course is prescribed; society standards and NCATE standards are fairly well set out in terms of what is required of the student. Pedagogically, our requirement is not different from some others, but it is better than other programs, technologically. I have the impression that this program uses courses across campus more, such as courses in the College of Business and the College of Arts and Sciences. Students have a diversity of educational experiences."

Students in the Agricultural Education major enroll in a 4-year undergraduate, teacher preparation program. As one teacher educator noted, "Students in production agriculture must take two to three courses each in plant science, animal science, farm management, and agricultural mechanics offered in the College of Food, Agricultural, and Environmental Sciences." The Agricultural Education program also added new requirements that increased its rigor.

As a teacher educator explained, "Our new vision for undergraduate programming, that we are working to implement, can be put up against any other programs in the University system in teacher preparation. We have built into that program the opportunity for students to complete more field-based experiences, with specific assignments, at the end of the freshman level." Also, "This is to help them explore career options and apply some of the theoretical foundations they had in introductory courses prior to going out." Students also have a second field-based

experience at the end of the sophomore year. The teacher added, "We are taking them into urban schools to do urban assignments. They will do part of their micro-teaching in a real classroom with real high school students. Their lesson planning, I think; is rigorous and includes writing a unit of instruction and daily plans. The student teaching experience is a forced field-based experience. I would say the rigor that has been put into the program measures up against any other academic program."

Classroom Management Preparation

Faculty members in CTE programs use a variety of strategies to prepare prospective teachers to manage the classroom environment. One teacher educator advocates a philosophy that "the more you manage, the less you discipline." Every Tuesday in one methods class, students spend about 15 to 20 minutes talking about a specific behavior found in the book, *You Can Handle Them All.* Students also practice dealing with class behaviors in a micro-teaching lab situation.

In some CTE programs, students must take a required course called "Classroom Management Needs," which addresses issues such as class management, liability, budgeting, and student evaluation. In one program, during the 10-week student teaching experience, students share their teaching experiences in a daylong workshop. One of the discussion topics is classroom management—"an ideal time to address concerns that are fresh on their minds," said one teacher educator. One program also provides classroom management seminars while students are completing their "clinical placement" experience during their last undergraduate spring quarter.

Knowledgeable Faculty

Each year, the University recognizes only two departments for outstanding teaching. The Agricultural Education program was honored in 2001—a significant response to the knowledgeable faculty in teaching, learning, educational content, and processes. Most CTE faculty members are highly knowledgeable in research design and processes, characteristics also rewarded at a major research university such as OSU. Although highly competent, CTE faculty knowledge appears to vary most in the area of student assessment, according to interviewed faculty members.

Model Exemplary Teaching

CTE faculty members offer a variety of ways they (and their graduates) model exemplary teaching. Faculty members model exemplary teaching by doing it, by being aware of effective practices and principles, and by giving students meaningful activities. They reflect after instructional sessions about what transpired, and are able to think forward and backward about practice. One teacher educator said, "We model exemplary teaching with thorough preparation. Most try to use a problem-solving teaching methodology, and a real effort is made to use the most recent instructional technology."

Another teacher educator cited, "Basic things such as professional demeanor and appearance are role models. Lessons are well-prepared, prompt, on time, and efficient. They encourage student participation and feedback, use technology where appropriate, set expectations for student performance, and use appropriate evaluation instruments." One teacher education program also buys out half of the time of persons who are currently excellent teachers in the public schools. These clinical educators in math, science, and technology education actually

teach some parts or all sections of some courses, and they also coordinate field activities for students. They are exemplary teachers who are assigned to school districts in and around the Columbus area who are also basically assigned half-time to OSU.

Modeling good teaching at OSU also means caring about the students and practicing scholarship. As one teacher educator pointed out, "You can tell if they care about students or not, if they like their job, if they like being here. With that comes good planning, trying new things, attending technical updates, and trying to make sure you are still current in your content knowledge. They are scholars of teaching, of pedagogy, of content delivery and management."

Integrate Academic and CTE

Several CTE programs emphasize writing as a way to integrate academic and CTE content. One faculty member suggested, "We [spend more time] talking about the integration of academic and career and technical education than we do, actually doing it." Another way to assure integration is to make sure that the general education courses are aligned with content standards for industry licensure.

Technology education, which is part of the math and science teacher education program (called math, science, and technology education) at OSU, has students that take a core set of courses together design "integrated" activities. For example, one of the problems students are given is to design a bridge structure. For the technology component, "we deal with the aspects of materials and building of the bridge," says a teacher educator in technology education. "For the science piece, they deal with how you figure out ratios and related physics. For the math, they must add angles and girders. There are a number of those activities they do together that combine aspects of all three disciplines—math, science, and technology."

Inquiry and Critical Thinking Emphasis

CTE faculty use scenario-driven types of learning activities in which students examine the thought processes and actions that make up decision making. Classroom assignments and papers require students to reflect and question their own activity. Case study methods and the problem-solving approach to teaching reinforce critical thinking and inquiry skills.

One CTE program builds student inquiry skills through an action research project. "Towards the middle and end of the program, students conduct an action teacher research project," said a teacher educator. Students design a proposal and implement an action research project, usually during the field placement experience in the spring quarter. Students collect and analyze the data as part of a capstone course before they finish the CTE program. Another CTE class helps students understand the difference between scientific and practical reasoning as a way to build inquiry and critical thinking skills.

Knowledge in Subject Matter

CTE faculty indicate vast knowledge exists among faculty in learning theory, work-based education, general education, and clinical experiences. Exceptional knowledge exists among faculty on how to provide clinical experiences. Some faculty members also have experience in the workplace, outside of the role of teacher educator.

Use of "Best Practices"

In explaining how "best practices" are incorporated into the teacher education program, one faculty member noted, "I experiment on my own [teaching], to see what works. I read and keep up to date on other pedagogical theories. I will try to add those, try to vary my instruction quite a bit." CTE faculty members routinely take ideas or practices from reputable journals. Changes made in undergraduate curriculum areas are based on standards and research, honed by advisory councils.

A teacher educator summed up a response to the question about how instructional strategies and delivery methods are used, based on "best practices" with a focus on students. The teacher educator suggested, "[From the perspective of] a former high school teacher and a graduate student, best practices means trying to see what works with each individual class, during lecture and discussion, or other activities. Asking students what works and is best for them, as opposed to relying just on what I might have read."

Diversity

Each CTE program deals with the diversity issue within the context of its traditional strengths and weaknesses. For example, the Agricultural Education faculty members have built in more experiences for students in urban settings, to counter the traditional perceptions that graduates will only teach in rural areas. This action also reinforces new directions in the College, which creates an urban–rural interface that is responsive to changing societal issues. Some programs that have been traditionally male-oriented regarding the workplace are integrating gender-bias-related topics into the curriculum.

Technology education strives to give prospective teachers experiences in rural, urban, and suburban locales, as well as teaching environments with gender diversity and persons with disabilities. Formal courses are offered, and students must complete structured assignments on diversity topics. All CTE programs address how to teach special population students.

Encourage Professional Development

CTE faculty members routinely attend professional development meetings and conferences. Some serve on advisory committees. Conducting research and reading important journals in their discipline(s) are common practices among CTE faculty at OSU. One faculty member noted, "The University offers more professional development than we could ever take advantage of, starting with a new faculty program. We could probably attend a different workshop each week if we took [full] advantage of what this University has to offer."

Faculty members strongly encourage program graduates to participate in professional growth activities. Some CTE programs offer a beginning teachers program. Inservice activities are provided for teachers in some CTE programs.

Update of Course Content

Recent changes in colleges and departments influence the purpose of course content, particularly related to workforce preparation. For example, the technology education program is now under the School of Physical Activity and Educational Services (PAES), along with math and science, in the College of Education. Emphasis is on integration of technology with math

and science, and less on workforce development. Other components of what used to be called vocational education (e.g., trade and industrial, business education) are now in the PAES program.

The Ohio Department of Education is a valuable resource to some of the CTE programs, by providing materials and other support that help keep programs up to date. Networking with other professionals, including those in business and industry, help keep CTE program contents updated. The Bureau of Labor Statistics also is a valuable resource for faculty, as are various sources on the Internet.

Partnerships

CTE programs with strong partnerships usually credit the cooperating teachers who help supervise the student teacher experiences. Because OSU is a very large institution, and consequently perceived by many as viewing students as "just a number," some CTE faculty believe it is extremely important that faculty closely supervise student teachers and visit the schools. As one faculty member noted, "One of our best contacts with the schools, administrators, and teachers is through the early experience program and student teacher placement." That College also maintains recruitment contact with public schools throughout the State, on behalf of its departments.

CTE and other administrators can obtain their administration certification from a number of institutions in the State. The State is divided into districts by the Ohio Department of Education. "Each year, the State district supervisors hold an administrator appreciation dinner in each district—a good partnership-building activity," said one teacher educator in Agricultural Education. The agriculture teacher brings his or her administrator to the dinner. It is also important to treat administrators well when they are on the OSU campus. Table 5 provides a summary of CTE areas, administration, paths to licensure, and ELI attributes for The Ohio State University.

Table 5
The Ohio State University (OSU)

Institution/ Type	CTE Areas	Administration	Paths to Licensure	ELI Attributes
OSU/Public Land Grant	Agriculture	College of Food, Agricultural, and Environmental Sciences	BS, 38-hour licensure program	Signature Attribute: • Supportive infrastructure of CTE mission Distinguishing Attributes: • National reputation and influence on CTE discipline • Professionalism and work ethic of faculty • Unique diversity of clinical experiences for students • "Cutting edge" impression left on students • Valuable connections to State department of education and professional associations • Emphasis on problem solving and critical thinking • Research and practice linkage • Curricula aligned to State and national standards • Student access to curricular and teaching resources • University support for faculty professional development • Large selection of supportive courses in non-CTE disciplines • Opportunities for addressing diversity in urban location of University
	Family and Consumer Science	Human Ecology	MEd	
	Business	College of Education (the official licensing agent for all teacher licensure areas)	38-hour licensure program	
	Marketing		38-hour licensure program	
	Technology Education		MEd or 38-hour licensure program	
	Trade/ Industrial		38-hour licensure program	

Summary Site 3: The Ohio State University

An historical infrastructure that supports the mission of CTE education, especially at the graduate level, is the signature attribute of The Ohio State University. The original National Center for Research in Vocational Education was located at OSU for 20 years. Also, OSU currently serves as the site of the National Dissemination Center for Career and Technical Education. OSU also is home to the ERIC Clearinghouse on Adult, Career, and Vocational Education, one of the 16 national Educational Resources Information Center (ERIC) clearinghouses for education in the United States. The College of Education also operates the Center on Education and Training for Employment (CETE).

Distinguishing attributes of the CTE programs at OSU are the large program and many highly visible graduates—particularly those who have completed graduate-level CTE programs and now have national reputations. CTE programs at OSU operate in the College of Education, the College of Food, Agricultural, and Environmental Sciences, and the College of Human Ecology. College administrators cite characteristics such as the Agricultural Education program, which has a national reputation in research and has greatly influenced the discipline. CTE faculty members demonstrate an exemplary work ethic and level of professionalism, according to focus group participants. They expect high levels of performance from their students, and the students believe that the program is intense. Former students frequently mention the dedication of professors with national reputations who are tireless, student-centered, and broad-minded. Faculty members connect students to professional organizations. Research and practice are linked in methods courses and field experiences.

The curriculum uses courses from other campus disciplines, and is driven by several sets of State and professional standards. A sequence of field observations and field-based experiences provides the basis for many student projects. The program includes field-based experiences with specific assignments at the end of the freshman level, and a second field-based experience at the end of the sophomore year. They do part of the microteaching experience in a real classroom with real high school students, for whom they plan lessons and units of instruction. CTE faculty model exemplary teaching and expose students to effective practices.

All CTE programs address how to teach special population students. CTE faculty members use scenario-driven learning activities, in which students examine the thought processes and actions that make up decision making. Classroom assignments and papers require students to reflect and question their own activity. Case study methods and the problem-solving approach to teaching reinforce critical thinking and inquiry skills. Updated course content reflects recent changes in colleges and departments. The Ohio Department of Education is a valuable resource connection for the CTE programs, as are the various components of the CTE infrastructure housed at the University and within professional organizations. Faculty members assist students in selecting support courses from the many academic disciplines available at this large university.

The urban location of the University enables faculty to address issues of diversity as an integral part of the curriculum. Each CTE program deals with the diversity issues within the context of its traditional strengths and weakness.

Site 4: The Pennsylvania State University

Program Characteristics

The Pennsylvania State University (Penn State) has 24 branch campuses located throughout the State. Many prospective teacher education students take introductory courses at other campuses and transfer to the main, University Park, campus. A Professional Certification Coordinating Council exists to facilitate the operation of quality teacher education programs. Workforce education programs are administered in the College of Education, while the Agricultural Education program is administered in the College of Agricultural Sciences.

When asked what the characteristics are that identified this university as having an exemplary, leading, and/or innovative CTE teacher preparation program, an administrator in the College of Education noted that, "In national rankings, our workforce education program typically lines up in the top one, two, or three in the nation. The Agricultural Education program is also ranked among the top five in the country. The CTE professional development center approach that we have here, where leadership is a shared responsibility and rotates between education and ag sciences, is an example of working together to have stronger programs."

The professional development center, funded by the Pennsylvania Department of Education, enables the parties in both colleges to contribute and collaborate with each other on a much more consistent basis. They jointly approach the Department of Education, and "the State has learned to depend on the talent that is here in the CTE programs."

Another administrator suggested, "The State of Pennsylvania has continued to be very supportive of career and technical education. We've been very fortunate in this state. For more than 60, closer to 80, years, the State has provided significant monies to fund quality CTE. They see the value in these programs and have continued to support and promote them. They have also consolidated their funding into centers in which they've brought together critical masses of people who are scholars, as opposed to diffusing their money across institutions that have only one or two vocational educators."

"I think this also has created a spirit among a number of program faculty to really create leadership that has enabled graduate students—especially doctoral students—to have supervisory roles and experiences. These students have then gone on to provide leadership, and have become quite credible on their own. This reflects well on the CTE programs at Penn State," said an administrator in reflecting why Penn State CTE probably was selected as one of the leading programs in the country.

As one administrator pointed out, "The University has for a long time encouraged inter-college programs, and supported them. Sometimes they've been very much involved with what goes on in an inter-college program, other times it was very hands-off, expecting the CTE Center for Professional Development director to run the show and interact with academic departments. Structurally, however, I think [the difference has] really been the freedom to create programs that cut across colleges and departments, pursue a variety of innovative activities, and to purchase services, in a sense, of faculty across colleges and across departments."

As another administrator in the College of Agricultural Sciences noted, regarding why Penn State has an exemplary program, "Faculty positions in CTE and Agricultural Education have been gutted in most universities around the country. As result, CTE programs in many places no longer have the critical mass to be effective. It takes longevity to build relationships with stakeholders and to get outside funding to operate teacher education programs, to attract high quality faculty. Penn State has maintained a high commitment to decentralizing decision making and to offering exemplary teacher education in career and technical education."

An administrator in the College of Education noted, "Penn State's land-grant mission also drives creation of quality CTE programs. Accrediting agencies now place greater focus on 'knowing' and 'doing.' The application of knowledge is helping people in the trenches. The CTE faculty and programs have a supportive structure at Penn State, and faculty members have good relationships with other people in areas of needed support."

Individuals prepared by the CTE teacher education programs at Penn State were also asked what characteristics caused this university to be identified as an exemplary, leading, and innovative CTE teacher preparation program. One of the respondents indicated, "Faculty and the University are willing to adapt to changes to better meet the needs of the times. PSU has high standards and is willing to do whatever it takes to get students through the programs." Another person commented, "They have advisory committees. I served on an interview committee to hire staff, even a committee to hire a department head. They listen to people's advice." One person indicated that, "PSU CTE is innovative because they stay in touch with us in the field and ask for our help. Any time I contact the department, I get an answer. They are very professional and very friendly."

A former student commented, "As students, we were given opportunities to network with teachers, to become part of a teacher's network. Many faculty are former teachers and/or administrators. They know what is going on in the field." Another person said, "The faculty are seen working with teachers and others, including the Pennsylvania Department of Education, to make programs exemplary."

Exemplary Practices

Focus group participants also were asked to specify practices that the university or department does that they would consider exemplary, leading and/or innovative. One participant notes the way student teaching is done for people who are already working. A faculty member comes to the school and a local resource person is your mentor. Another focus group participant says, "The Governor's Institutes in the summer are really beneficial in keeping us up to date."

Another participant liked the way the program "helped me get teaching-related experiences in many different places." An innovative practice for one participant was how the CTE program helped him get dual certification, not just certification in one area.

People

Focus group members rapidly recognized how the people at the university contribute to the ideals of exemplary, leading, and/or innovative CTE teacher preparation. One former student noted, "It was great, the way they send new teachers to visit the highly experienced teachers."

Another participant was impressed by the way a faculty member was on a national study committee and brought the information back to the students in the class quickly and in an interesting manner. "Faculty practice what they preach, so we can take their examples and actually use them in the classroom," was a comment by one member of the focus group. Another noted, "I appreciated the flexibility of faculty in dealing with people, even in making lessons more practical. The faculty are positive, no gloom and doom approach, more proactive than reactive," said one focus group participant.

These former students could recall the tremendous effort that faculty put forth to help them, to keep them up-to-date, and to connect their information to the world of practice in the school setting. One participant also thought many faculty members were exemplary in going beyond the boundaries of the Pennsylvania through involvement in national professional organizations, to bring back ideas and practices that would help their students be successful.

Standards

The focus group participants were also asked to explain how outcome standards are emphasized at the University. Integration of standards for core academic courses into CTE courses at the high school level was a priority of faculty in some CTE programs. One focus group member also noted that the standards and outcomes were included in the Governor's Institute for Agricultural Science Careers. Standards also were prevalent in the CTE student organizations.

Rigor

Focus group participants also perceived their CTE programs to be as rigorous as other teacher preparation programs at the University. The response from these individuals focused on the perceived rigor of field-based learning. While rigor is often thought of in terms of grueling academic work, these individuals decided to focus their definition in a different way. Among the comments of focus group participants were the following:

"They immediately, in my program, had me out in schools as much as possible to help me decide if I wanted to be a teacher—before I spent 4 years, and then decided I wanted to be something else."

"The program is as rigorous as it can get if you are to complete it in 4 years."

"The work experience requirement in your own field leads me to believe our CTE programs are more rigorous."

"All the competency testing is starting to be too much, if we are to complete the program in 4 years."

Modeling Exemplary Teaching

Focus group members acknowledged how teachers model exemplary teaching. One participant noted, "Each assignment given by a professor is applicable in the classroom, if you are teaching." Another said, "At the Governor's Institute, student teachers were given an

opportunity to present their projects." Students were given the opportunity to write grants with their cooperating teacher, and then the students presented the results of the integration grants at the Institute. This model exemplary teaching program provided collaboration, community service, integration, and presentation through active student participation and learning.

One former student expressed that "faculty are willing to adapt when something is not working. They just don't say: it is my way, or the highway." Another focus group participant appreciated faculty members bringing national experts into their classes. The fact that the CTE programs place resource people in various places in the State to give students access to quality people was an exemplary practice.

One focus group member emphasized that, "you always see Penn State CTE faculty in the field; they give more hours." Also, said a session participant, "Faculty consider people's backgrounds, as they try to help them with application examples for using the skills in their CTE programs." Lastly, one focus group participant thought it was very exemplary that, "faculty belong to the teachers' association, as well as their own college faculty's association."

Faculty Interviews

Impact of Standards

CTE faculty members at Penn State have reacted to new standards related to their teacher education programs. For example, a professor of Agricultural Education said, "Our curriculum development courses are now applying everything to the (State), thus keeping our students on-target to the standards. So we've identified the academic standards for Pennsylvania and now, whenever they produce unit plans or lesson plans, they have to tie them back to the standards that have been approved by Pennsylvania." A problem exists in that Pennsylvania has only academic standards approved. They don't have any workforce or occupational standards approved—only for the core academic subjects. Therefore, students in Agricultural Education have to tie agricultural subject matter back to the core academic standards.

The workforce education program that prepares teachers for the trade and industrial areas has reacted to several standards. Most prominently are the NOCTI standards for occupations and the PRAXIS test, as well as the NCATE requirements. As one teacher educator in workforce education noted, "There are a lot of requirements that seem to be external to the program. Now they have to do a special needs test and a PRAXIS test. I would say that is the most visible impact of the standards movement."

Program Rigor

The program for preparing industrial and technical CTE teachers is nontraditional. Workforce education has two different models for preparing teachers: a full-time baccalaureate for secondary education, and an outreach model in which the trade experience is a prerequisite, and they learn their pedagogy as part of their induction program to become permanently certified. A workforce teacher educator pointed out, "Our program is quite different, and the undergraduate program is quite different, because we're dealing with a non-traditional population—an outreach-based program. Therefore, rather than have practice teaching, although we do have a full-time undergraduate program, our program is based on actual supervision of

instruction because the students are full-time employees in the schools. They are new teachers in the schools, so to that extent, it really is different." The program has the same State requirements as other programs.

One teacher educator argued that the non-traditional program may be more rigorous. In addition to meeting the same standards as other teacher education students, "Our students must have a minimum of 2 years of wage-earning experience in an occupation before they can qualify to take the NOCTI exam toward State certification. So, rather than simply doing a paper and pencil test in their specialty area, as the academics do in math, English, science, or practice exam, we have a written and performance exam."

The CTE teacher education program may also be more rigorous than the common "academic" teacher education program. As one teacher educator in Agricultural Education pointed out, "We currently are under pressure to reduce the number of credits we require for program graduation. We require 136, and other teacher education programs require 120–126. We believe we need the additional credits for students to receive adequate preparation in the technical agriculture areas, so our program might be a little more rigorous, from that standpoint, compared with other programs."

Classroom Management Preparation

While classroom management strategies are included in several courses, teacher educators in Agricultural Education emphasized that exposure to the real classroom setting is the best way to learn classroom management skills. "We think that classroom management is a scenario where you have to get out there and experience it." The students receive three different field-based experiences. One is an early field-based experience, in which they spend a week in a school. A second experience requires that they spend 5 days with a co-op teacher prior to ever being placed in a school for student teaching. The third is the field-based student teaching experience.

Full-time students in the baccalaureate degree program also get early and frequent exposure to the actual teaching situation in the field at schools. A workforce teacher educator explained, "We have a minimum requirement of 1 semester in the field with a teacher in their occupational specialty, but typically encourage them to do more than that. We also have a collegiate (SkillsUSA–VICA) chapter that we use to engage our prospective teachers with the high school student population they're going to be working with. So they get to see teachers in the classroom and to be in that classroom."

Students in the non-traditional trade and industrial program receive a workshop in August, a sort of "boot camp," said a faculty member. "We spend 5 days preparing them for what they are going to be encountering, and then spend the next 2 years reinforcing that with on-site delivery of courses." These prospective teachers have a close mentoring experience with a practicing instructor employed by the University. The teacher educator explained, "If it is someone hired in the classroom based on work experience and passing the PRAXIS exam, we spend the first 2 years of their teaching career in their classroom 1 day a week every other week. So we're there providing in-person mentoring. We also have local resource persons at every school, so there is someone on-site they can reach." Another explained, "We provide coaching in the classroom for

clinical supervision of instruction. We have instructors specifically for this program who actually go out, observe, and help beginning teachers in the field."

Knowledgeable Faculty

A CTE faculty member in the workforce education program believed the use of instructors from secondary schools adds a particular strength in preparing the industrial and technical teachers. "The individuals who teach probably 80% of the coursework that leads to certification are current career and technical educators. So I gained the advantage of practical application of theory for prospective teachers. They're giving them [prospective teachers] everyday instances where they are applying the very theories, concepts, and principles about being an educator that the students are learning about in the class. So, it's not like they're telling us this but they don't know what they're doing. These people are doing it the next day when they go back to their regular jobs, so it brings that relevance to the classroom."

All faculty in the workforce education program have taught and/or are practicing presently as teachers; they have first-hand experience. Assessment in CTE has been a major strength. A faculty member pointed out, "We are strong in that area, particularly as the curriculum is module-based and outcomes-based. Basic assessment is strong." Also, Penn State ranks as a major research university and everyone at the main campus has faculty rank and, depending on the program, is expected to do research. Some instructors in the field have Ph.D.s, and some do not. As a faculty member noted, "In the preparation of teachers, research is not a priority. Good researchers do not necessarily make good or bad teachers. Some people argue that they actually make bad teachers."

A faculty member in the Agricultural Education program noted, "Our preservice faculty here at Penn State are very much aware of all those areas: teaching and learning, educational content and processes, assessments, and research design and processes. Everybody holds the Ph.D. degree, and we've all had a lot of teaching and learning and educational processes. Research and design are extremely strong in our program because we've come from large land-grant institutions with good research-oriented programs. And what makes preservice faculty knowledgeable in these areas is the fact that we all work in the preservice area. We haven't spent 10 years doing something else, and then decided to shift over to preservice. Most of the people, all of the people that are in there, have been there, so they've had lots of experience."

Model Exemplary Teaching

The strength of the nontraditional teachers program is its clinical supervision. Prospective teachers see effective people teach. As one faculty member pointed out, "Basically, we watch students teach; we videotape them teaching and critique their teaching with them and, therefore, it's live, on-the-job modeling. In the outreach program, they're visited four times per semester for 4 semesters. It's a 2-year program."

Excellent instructors are picked and paid as "fixed term" employees to deliver the outreach courses and supervision in the non-traditional program. They are good models for prospective teachers. Matching preservice teachers with inservice teachers also enables the inservice teachers to give applications examples when a particular issue needs to be addressed (e.g., safety in the lab).

An Agricultural Education faculty member noted, "Faculty go out into the schools with our beginner teacher programs, with our student teacher programs, our early field experience programs. We go out there all the time, we're very cognizant of what's out there, and we try to model that behavior for them; actually, we try to elevate that behavior, in most instances."

Integrate Academic and CTE

The faculty in Agricultural Education follow a philosophy that agriculture is an applied biological field. Course selection reinforces that philosophy. As one faculty member noted, "We suggest that students take courses that will be valuable later as a teacher of agriculture, such as a math statistics course where there is practical application of statistics while you're looking at plant populations, etc. We think this will help them integrate academics into the agriculture program in the high school setting. Also, for a humanities course, we encourage them to take a course called Science, Technology, and Society."

Workforce education faculty members also strive to help prospective teachers learn that the modern workplace requires both academic and technical skills. As one faculty member explained, "One of the things we've done in the Professional Development Center is create a professional development team. One of their obligations over the last 10 years has been to work with schools, in on-site group and individualized training to stimulate the process of integrating academic and technical education for the inservice teachers. In terms of preservice, it's woven through all of our courses, and we want to see it even more heavily played up within our undergraduate courses, so that people begin to realize that the workforce is demanding individuals who have both occupational and academic skills."

Inquiry and Critical Thinking Emphasis

The Agricultural Education program includes a section called "problem solving in agriculture." "Because a research study by an Ag Ed faculty member found that few faculty in the College were teaching at a very high level based on Bloom's Taxonomy, we started to integrate case studies and problem solving scenarios into our program that would force our students to think." The Ag Ed methods courses also include a significant section on using problem-solving methods in teaching.

Members of the workforce education faculty use a variety of methods to address critical thinking. Case studies are prevalent in CTE programs. A faculty member noted, "We use a mixture of instructional techniques. Where appropriate, we use constructivism, and where it's not appropriate, we don't use it." Few of the prospective industrial and technical teachers will glean information from research journals. Faculty members use other approaches that get the teachers to think critically. Another faculty member pointed out, "So what you have to do is take it out of that context and say: all right, here's what's been looked at, here's how you can apply it in your classroom, and begin that chain of events—so that hopefully they'll continue looking for additional information." However, "You do have to draw the line between giving them too much and suggesting that everything is handed to them, rather than having them work for it. You have to entice them into it (critical thinking), and make them do some work for themselves; otherwise they'll never do it again."

Knowledge in Subject Matter

When asked to assess faculty's base of subject matter knowledge in learning theory, work-based education, general education, and clinical experiences, CTE faculty members are perceived as quite knowledgeable in each area. Perhaps the greatest knowledge among CTE faculty is in clinical experiences. Courses reflect a strong orientation that students learn by doing. The Professional Development Center provides the vehicle for faculty to discuss various elements and issues of work-based learning. Programs and faculty are stronger in learning theory and work-based education because of the State-supported Center, according to several CTE faculty members.

Use of "Best Practices"

When asked to what extent they use instructional strategies and delivery methods based on the concept of "best practices," CTE faculty in the workforce education program reported they use a Competency-Based Teacher Education (CBTE) field-based model that incorporates best practices. This approach has been used since 1978. The program then switches from field-based to classroom-based education for the second phase of the certification program.

As one faculty member said, "I'm not convinced that individualized study should be continued for their whole certification program. I want that rich contextual interplay to happen in the classroom-based environment that can't happen when I have my field resource person going in [only] 1 day a week to work with this individual on a one-on-one basis. I want to draw them out of that environment. They've been in there 2 years supporting their development, now I want them to come out and interact with other people. The program offers six classes in six different locations around the State. Classes are rotated through each of those sites in a 4-year cycle. Someone working towards their certification can attend one of those sites, and in 4 years get all of our courses they need for certification."

In Agricultural Education, "best practices" means "those things that have arisen from the field, where people have said, I've done this 100 times, and this is the best way to do it," according to a faculty member. These also include research-based best practices reported in magazines such as *Phi Delta Kappan* and journals such as the *Journal of Teacher Education*.

Diversity

Recognizing diversity is a major objective of the University. In addition to a very diverse student population on the University's main campus, a large diversity of students are enrolled in the workforce education program, including many students from other countries. A course in vocational guidance and a course in vocational special populations address many issues related to diversity. Every faculty member gave a presentation outside of the United States last year. Several African Americans have completed the Ph.D. program. A wide range of ages is represented in the student population in the department.

Agricultural Education faculty use a specific set of lesson plans on diversity that was developed through a research project in the department on teaching diversity in a secondary classroom and an agricultural education classroom. Students also receive instruction about the different kinds of cultures in agricultural areas of the United States, as well as in urban areas.

Several faculty members are involved in projects in other countries. Many Ph.D. students in Agricultural Education are from other countries.

Encourage Professional Development

Professionalism receives key emphasis in workforce education and Agricultural Education programs. At this research institution, "faculty are always involved in their own professional development, called research and service," said one faculty member. The workforce education program has one of the few collegiate SkillsUSA-VICA programs in the country. Agricultural Education has an honors Alpha Tau Alpha chapter.

For students in the nontraditional workforce education program, their professional development goal is to become certified. Also, the State has new requirements that all teachers obtain specific amounts of professional development throughout their career. On-line modules are being developed to accommodate the need for industrial and technical teachers to meet the new requirements.

The Center for Professional Personnel Development also enables CTE faculty to participate in, as well as encourages, professional development. State funds allow many secondary CTE teachers to take advantage of professional development opportunities. Agricultural Education teacher educators also work closely with the Pennsylvania Association of Agricultural Educators to plan and offer professional development activities for agriculture teachers. As one faculty member noted, "We provide the resources and, oftentimes, they provide the leadership. We also do the leadership part of it, too, such as setting up and developing the curriculum for a workshop or seminar. We are just greatly interested in getting high quality professional development opportunities out there, regardless of who does it."

Update of Course Content

An annual conference held each summer for agriculture teachers, with at least 1 day devoted to visits to industry, helps keep course content up-to-date. "The Pennsylvania Department of Education does an excellent job in providing many professional update opportunities related to workforce development," said one faculty member.

In the workforce education program, the local resource person helps keep the program up-to-date. Because students in the program are also teachers in schools, this helps keep the program changing to meet their needs in the real classroom setting. In Pennsylvania, general advisory committees are mandated for programs in career and technical schools. Individual CTE programs in the State are also required to have advisory committees. Moreover, The Center for Professional Personnel Development has an advisory committee that meets twice each year. All career and technical education directors in the region served by the Center are also invited to an annual half-week workshop to discuss issues in CTE, particularly teacher education. The directors determine the agenda for the workshop. Also, directors of the CTE Center for Professional Personnel Development at Penn State meet quarterly with Pennsylvania Department of Education staff to discuss changes needed to keep up-to-date with new developments in CTE.

Partnerships

Partnerships can be an effective way to deliver CTE programs; research participants at Penn State explained the impact at their institution. As one CTE faculty member put it, "It's a lot of work. It takes effort. You can't have a partnership without effort. My field resource people, for example, could easily sign in, go see their teacher, and disappear. That's not building a partnership. Building a partnership is when you go into the building trying to at least meet that administrator or teacher and get any feedback. To kill off a partnership, all you have to do is be nasty to that person. So we try to let our staff know that you need to cultivate this partnership. We ask local CTE administrators what they need. And that's extra work, when you're trying to respond to what they want, as opposed to what would be more easily planned and conducted by our staff at the University."

Working with partners in business and industry is also important to successful CTE teacher education programs. A teacher educator in Agricultural Education noted, "I think we develop those partnerships by actively seeking them out, and not waiting for them to come to us. Our experience has been that there is receptivity to a partnership within some industries, but we have to be more of the aggressor on this end. We have to be more of the initiator. We've basically remembered the one rule that goes along with the basic theory of collaboration, and that's quite simply that there's something in it for everybody, or eventually the collaboration system doesn't work too well."

CTE programs at Penn State have a close working relationship with many important professional associations and industry representatives. Also obvious at Penn State is that no partnership is more important to the exemplary practices in career and technical education than the partnership with the Pennsylvania Department of Education that supports the CTE Center for Professional Personnel Development. Table 6 provides a summary of CTE areas, administration, paths to licensure, and ELI attributes for The Pennsylvania State University.

Table 6
The Pennsylvania State University (PSU)

Institution/ Type	CTE Areas	Administration	Paths to Licensure	ELI Attributes
PSU/Public Land Grant	Agriculture	College of Agricultural Sciences	BS, MEd, MS, Post-Bacc Cert	Signature Attribute: • State-supported Center for Professional Personnel Development Distinguishing Attributes: • Collaboration among CTE faculty • University and field support for CTE • Positive, proactive, professional faculty • Close relationships with CTE teachers' associations • Program flexibility for nontraditional students • Clinical supervision program for certifying Trade and Industrial teachers • Numerous field-based learning opportunities for students • Emphasis on learning by doing and competency-based education • Research and practice linkage • Adaptation of curricula to state and national standards • Emphasis on providing professional development opportunities for teachers
	Health Occupations	College of Education (the official licensing agent for Agriculture)	BS, MEd, MS, Alternate Non-Degree	
	Occupational Home Economics		BS, MEd, MS, Alternate Non-Degree	
	Trade/Industrial		BS, MEd, MS, Alternate Non-Degree	

Summary Site 4: The Pennsylvania State University

The signature attribute of the CTE programs at The Pennsylvania State University is its long-term, State-supported Center for Professional Personnel Development, which exists between the colleges of Agricultural Sciences and Education to provide teacher certification and professional development services. This Center can purchase services of other faculty across the University system, as well as hire adjuncts, to provide professional development programs. The Center has a professional development team that works with schools and inservice teachers, enabling faculty to discuss educational issues. This structure supports good relationships among people in various disciplines at the University.

Programs and faculty benefit greatly from the strong support within the State for career-technical education in higher education. The University also encourages innovative inter-college programs, and the CTE teacher preparation programs have such a program at their core.

Faculty are proactive and professional, as they offer two very different teacher preparation models. There is a non-traditional field-based model for people in the trades and in health care occupations, and a traditional Bachelor of Science or post-baccalaureate model. There are close mentoring experiences and clinical supervision for the teacher candidates, regardless of the path chosen. Students are enthusiastic about the flexibility offered by this program, which is frequently ranked among the top five CTE teacher preparation programs nationally. The traditional model provides students in workforce education and agricultural education with an engaging University experience, with a number of field-based learning experiences.

Faculty members are very experienced in preservice education and emphasize a competency-based, learning-by-doing approach. Faculty members work with partners in business, industry, and professional associations to make programs relevant and up-to-date. Research is linked with practice, as faculty members integrate new standards into curricula appropriate for CTE programs in the public schools. Some programs require an integration project, with the cooperating teacher and an academic-content teacher guiding the student during the field-based student teaching experience. CTE programs also provide professional development opportunities for teachers.

Site 5: Virginia Polytechnic Institute and State University

Program Characteristics

Virginia Polytechnic Institute and State University (VPI&SU) is a land-grant institution with a comprehensive program in career and technical education. Teacher preparation programs are offered in Agriculture, Business, Family and Consumer Science, Health Occupations, Marketing, Technology Education, and Trade and Industrial Education. CTE programs are housed in the College of Human Resources and Education. When asked what the characteristics are that caused the university to be identified as having exemplary, leading, and/or innovative (ELI) CTE teacher preparation programs, an administrator in the College of Education noted, "Number one is the faculty. They are outstanding faculty members. Most have been at Virginia Tech for 30 years. Vo-Technology Education has always been a good faculty—with a really strong commitment to working with students, to preparing teachers to do the real work of teaching, not

[just] theoretical. They have a good feel for the field. When people come out of our CTE programs, they have a good feel for beginning their careers as teachers."

Another administrator noted, "The most essential characteristic would be the quality of the faculty. We have a group of faculty who are national leaders in their respective areas and are familiar with the most current trends in the field. In addition, they have a strong commitment to providing high quality experiences for teachers."

The comprehensive nature of the program is also a strength, according to one administrator. "It enables the faculty to approach CTE from more of a conceptual base. They problem-solve issues, and it is clear that the multiple perspectives represented by faculty in different specialties is an asset to their planning." Administrators also acknowledge the close relationships that the faculty members have with their colleagues in the public schools.

Integration of technology throughout the program is another area in which VPI&SU CTE programs demonstrate their leadership and innovativeness. For example, faculty members have worked diligently to offer Web-based courses. As one administrator pointed out, "The faculty are well aware that their students will be judged on how current they are on using technology in their practice." At VPI&SU, the University sponsors faculty skills improvement in technology. Every 3 years, faculty members are able to attend a customized, week-long inservice training on using the latest technology in instruction. As a result of participation in the inservice, faculty members receive updated technology equipment, such as new computers.

University policies give CTE faculty members the autonomy to establish innovative programs. "While there are University and professional requirements, the CTE faculty has great latitude in shaping the nature of the program curriculum and field placements. They are encouraged to try new things if think they will make a difference," said a College administrator.

In further explaining the characteristics that caused VPI&SU to be identified as having ELI CTE teacher preparation programs, an administrator stated, "There is an 'anyplace, anytime' service for unprepared teachers and those teachers considered out-of-field. The faculty has a strong commitment to practicing educators through workshops and degree programs that they offer to school systems via contracts."

A focus group of alumni and teachers prepared by the CTE teacher education programs at VPI&SU were also asked to identify the characteristics that caused the University to be identified as having ELI CTE teacher preparation programs. Among their responses were:

"Faculty are aggressive in making changes and incorporating them into classes."

"One thing that stands out is that a lot of professors are involved in national groups, so they bring back a lot of experiences. When I went through, the marketing teacher preparation program was number one in the nation."

"Not only do the faculty teach us the newest technology, but they use it, as well. They not only teach us, they show us, so we could take off on how they used it and learn ourselves."

"At Tech, you can find a specialist in technology and could find someone to help in just about anything, not just in my department [industrial arts], *but anywhere."*

Exemplary Practices

Focus group participants also were asked to specify practices that the University or Department does that they would consider ELI. "They always came to observe us while student teaching," said one focus group participant. Faculty members also strongly encouraged students to attend conferences. Another participant noted, "A lot of teacher-education areas give a pass-fail grade; the student teaching in vocational areas is much more specific, with a lot of extra work. But once you start to teach, you realize why you were doing those activities. It pushes you to meet business people and do other things than just teach."

Focus group participants explained that during the student teaching process, they had the opportunity to sit down with the cooperating teacher. As a participant noted, "He wrote things down that you did well, and told you where you needed improvement. One professor had students create an electronic portfolio. Professors used a lot of real-world examples in class." Another former student noted, "I had to learn about equipment and different types of machines in such a way so I could apply it in the classroom."

People

Focus group members were also asked to explain how the people at the University contribute to the ideals of ELI CTE teacher preparation. One former student noted, "The faculty work together, not separately." Another participant noted, "They embrace current trends and keep up with everything in what they teach, from the Family and Consumer Science program to other departments."

Professors at VPI&SU are interested in creating an outstanding teacher; they want to go the extra mile for the student teacher, according to focus group participants. They are motivators, always trying to direct students in ways they can excel. As one focus group participant noted, "They have an amazing sense of pride, they talk about their students from years ago and are very proud. They want to produce the best teachers. They want to brag that this is their best teacher winning all these awards. I think that's why they follow up on us so much. They want to be sure we don't fall to the bottom of the heap. They keep on us throughout our professional career."

Standards

The focus group participants were also asked to explain how outcome standards are emphasized at the University. Participants emphasized how CTE faculty members provide students with the rationale for the Standards of Learning in Virginia. They provide students with curriculum guides on the core standards. As one former student pointed out, "We did lesson plans, and we were required to show when we taught a subject that it was related to integration of another core subject in the class."

Faculty members also encourage students to use the excellent list of competencies that are available in the different CTE areas. Linking the competencies to the State standards is a common practice that encourages students to teach more than what is measured on the State test. Faculty provide students with a variety of excellent resource materials that make this possible, according to focus group participants. As one current teacher noted, "They really assured us to go with the competencies, stick to what you know, teach the way that you know your students will be learning the material. It will be just fine."

Rigor

Focus group participants also perceived their CTE programs to be as rigorous as other teacher preparation's programs at the University. Among the comments of focus group participants were the following:

"One aspect is the grading standards. If you turn in a lesson plan that does not have everything in it, you get it back until it is done right. Standards are high, and they expect you to reach them every time."

"It's a very rigorous program. When teaching, you're going in a million directions. So this is too much. That's what teaching is really like, they do a good job of preparing us—you're overwhelmed. But it's not so bad when you start teaching because you've already gone through that with your peers and have your comfort zone. So, you can handle things better."

"In student teaching, we had so many extra assignments. It seemed kind of pointless. But when you start teaching, there's so much more than making lesson plans."

Modeling Exemplary Teaching

Focus group members acknowledged how teachers model exemplary teaching. One participant noted, "One thing is, they model professional behavior. For example, one professor conducted class like we were in high school and trying to prepare us for what that teacher knew would be a standard in school—for example, don't start class with students wearing hats. Most schools do not allow students to wear hats in class. It might have seemed silly at the time, but it made sense later."

Focus group participants were quick to compliment how CTE faculty members allowed themselves to be very human, and the students got to know them. As one current teacher explained, "When class is over, they don't want to get rid of you—they want you to do

something with them." Another focus group member noted, "Other colleges don't have that; we're just luckier. CTE faculty get to know you on a human level." "Faculty work to get to know you, to build a real sense of community," said one current teacher in the group.

Faculty Interviews

Impact of Standards

Standards are a critical element in all CTE programs at VPI&SU. Programs have to meet NCATE, INTASC, and a variety of technology standards. One faculty member noted, "We have totally integrated technology into all our teacher education programs. The emphasis is on being a model as a teacher. We demonstrate that our teacher candidates do impact student learning because of NCATE." Faculty members emphasize that standards guide both the undergraduate programs and the 5th-year graduate programs that came about because VPI&SU became a member of the Holmes Group movement.

Standards have been integrated into CTE courses, and students must demonstrate how lesson plans and other instructional activities meet the standards. As one faculty member pointed out, "We are going through NCATE now, and must check where we meet standards on a matrix."

Program Rigor

Faculty members perceived CTE programs to be as rigorous as other teacher education programs. These professors believed that rigor in their CTE preparations program went beyond the standard view of rigorous classroom work. One faculty member noted, "We think our student teaching is more rigorous in the [amount of] time we spend with students. We have a philosophy that we visit three times per 15-week term. The first 5 weeks they observe, prepare lesson plans, and do a whole list of stuff, and then they start teaching. We visit three times during the last 10 weeks. They all must have a 2.5 GPA, overall. So it's equal across areas."

Another faculty member pointed out, "Actually, I feel we are more advanced than they are (in the College of Education). The reason is in our internship or student teaching. We spend the entire day with one student teacher, we observe, have the student teacher do self-evaluations, sit down with them and with the co-op teacher, and give feedback. Other academic areas just put them out there."

Classroom Management Preparation

In methods and curriculum courses, discipline, organization, planning, and instruction are related to classroom management, including how to manage the classroom to best serve special needs students. Faculty members teach planning skills. Early field experience for students, usually in the junior year, and seminars address classroom management skills. Faculty also conduct activities through student organizations and teacher associations that reinforce how to manage the classroom.

Knowledgeable Faculty

Faculty have many years of experience, and have exceptional knowledge in teaching and learning, educational content and processes, and research. VPI&SU is a major research University where faculty members are rewarded for research. As one faculty member noted, "In

teaching and learning, we have several experts. We try to model good teaching." Many faculty members have published widely and relate their research to teaching and learning. "We are extremely good at teaching and learning. We have veteran faculty, and they are good at all areas."

Model Exemplary Teaching

Faculty members are student-oriented and care about how their teaching impacts the learning of their students. They use visuals and employ hands-on activities to demonstrate critical thinking action. Faculty members use a variety of activities in efforts to address all learning styles. As one faculty member pointed out, "We try to model what we want to see when our students go out to teach." Another faculty member noted, "We do this both on campus and outside campus. We (faculty members) talk about good teaching and share the ideas from each other. Also, our cooperative teachers in the State are good. They model good teaching." Undergraduate students also mentioned that they feel guided by their professors: "In curriculum class, the professor talked about the objectives and how it achieve them." Another students mentioned, "Professors like their work, and have great passion and genuine interest in their jobs. They spend extra time and come over on the weekends. They consider what they are doing not only a job for them, but something they love to do, and do it better."

Integrate Academic and CTE

Curriculum and methods classes include a unit on integrating academics into career and technology education programs. Students are required to develop a lesson plan that integrates academic and technology education. A Center for Teacher Education in the CTE department sponsors projects, some of which have been on integrating academics into CTE, for student teachers. In past years, the faculty have offered seminars with professors in the "academic" areas for student teachers, to cooperatively address the integration issue. This approach worked in some cases, where the "academic" professors were really interested in doing it.

One CTE faculty member noted, "Students learn all about curriculum and how to develop curriculum and how to integrate SOLs (Standards of Learning) into every single lesson plan in 'methods.' They do 20-minute micro-teaching, and they must integrate SOLs." The state Department of Education also provides curriculum guides that list the core competencies that teachers must teach. Students regularly use the State department's Web site to access the standards for preparing lesson plans and related instruction.

Inquiry and Critical Thinking Emphasis

To teach critical thinking, one faculty member noted, "We emphasize the cognitive domain and develop a chart to help teach students to connect to the psychomotor domain." In curriculum and in methods classes, faculty members address inquiry and critical thinking. Faculty members try to model inquiry and critical thinking. It also is a topic in the student teaching experience, where the CTE faculty member discusses the topic with the student. Together, the student and faculty member talk about strategies for ensuring that the lesson addresses inquiry and critical thinking skills.

"In class, we try to use a lot of student-centered things, such as case studies, in which they have to come up with a solution," said a CTE faculty member. "They have to figure out their priorities. They have to take the State curriculum and list competencies and fit it into 180 days, figure out how much time to spend on the topics, and then they think how to get the depth and breadth necessary." Students use inquiry to figure out what to teach, and write "reflective" papers on teaching in the schools.

Knowledge in Subject Matter

Work-based education and clinical experiences are areas of greatest strength for CTE faculty members. CTE faculty members emphasize the learning theory related to work-based education and the clinical experience most frequently in classes. Faculty also draw upon the vast resources of expertise at the University when helping students select appropriate general education courses.

Regarding knowledge of the subject matter, one professor said, "In teaching and learning, we have several experts. We try to model good teaching, and [then] we stop class and say: OK, what did we do here? Educational content and process—we cover that pretty well. In research and design, 5 to 10 know a lot, but for some faculty it is not their forte." Another professor mentioned the research strength of the faculty, "We are particularly strong in research design because of the publishing and presenting [researchers] do. One thing they do particularly well is [developing and posting] on-line courses for teachers. They have done a beautiful job, and demonstrated what they know about teaching and learning, and put it into practice. It has really met a need in our State because Virginia Tech is one of the few place in the State to do this."

Use of "Best Practices"

When asked to what extent they use instructional strategies and delivery methods based on the concept of "best practices," one CTE faculty member noted, "Well, I hope I use them a whole lot. I'm always studying and looking at ways to do things. I never teach anything the same way [twice]. I revise my lesson plans from the previous year. The purpose of doing research is to bring it into the classroom, which I do regularly."

Faculty members also take advantage of the Governor's Best Practice Centers for education. Eight centers in the State collect and promote the use of best practices in the public schools. These are a resource for the College, including the CTE faculty.

Diversity

How to be successful in teaching in classes with a wide diversity of students is a discussion students have in classes with professors, as well as with the cooperative teachers in the schools. Students also take a course in how to teach special populations. The issue can be a problem for VPI&SU because of its location in rural Southwestern Virginia, since there are limited populations of non-white residents. A faculty member pointed out, "Each faculty member works with a strand of students, such as first-generation college students, or socioeconomic disadvantaged, or disabled. The CTE programs try to get students into the only nearby urban area. Faculty work diligently to help students recognize the need for a good attitude in dealing with [all] people, and having an open attitude."

Encourage Professional Development

CTE faculty members encourage students to become members of their respective professional associations. LISTSERVS are available for students to network. "We encourage students to participate in conferences at local and state levels, teachers' conferences, professional organizations, and to write to the magazine in their professional area, said one faculty member.

Professional development for faculty includes active involvement in national organizations and in leadership positions. Faculty members conduct research and publish results in reputable journals. VPI&SU also offers a professional development institute. A CTE faculty member pointed out, "We have a faculty development institute, and every 3 years faculty can sign up to get a new computer if they take an advanced technology course and integrate technology into their courses. This has been a major professional development commitment of the University."

Update of Course Content

Research activities also enable faculty members to keep course content relevant and up-to-date. Reading magazines and journals, networking with colleagues at various State and national conferences, and close contact with cooperating teachers help faculty members stay current in their respective CTE fields.

Partnerships

According to faculty, one logical partnership is the student teaching program. As a faculty member noted, "We try hard to make this a partnership: the school, student, teacher educator, and the cooperating teacher in the school all invest in determining the grade." Successfully placing students in teaching jobs also requires being an effective partner with the school systems. Some faculty members attend statewide CTE administration meetings to foster relationships that provide a foundation for good partnerships. Having a good working relationship with the appropriate State teachers' association and the State department of education are also important.

Table 7 provides a summary of CTE areas, administration, paths to licensure, and ELI attributes for the Virginia Polytechnic Institute and State University.

Table 7
Virginia Polytechnic Institute and State University (VPI&SU)

Institution/ Type	CTE Areas	Administration	Paths to Licensure	ELI Attributes
VPI&SU- Public Land Grant	Agriculture	College of Human Resources and Education	BS, MS	Signature Attribute: • Technology integration and support for technology Distinguishing Attributes: • Highly experienced, nationally recognized senior faculty • Holistic view of students • Rigorous field experiences and faculty supervision • Faculty cohesive working relationships • Faculty sense of pride in graduates • Emphasis on competency-based approach • Integration of State academic standards into CTE curricula • Faculty model inquiry and critical thinking • Research and practice linkage • Access to supportive courses in other disciplines • Maintain good working relationships with CTE teachers' associations and State department of education
	Business		BS, MS	
	Family and Consumer Science		BS, MS	
	Health Occupations		BS, MS	
	Marketing		BS, MS	
	Technology Education		BS, MS	
	Trade/Industrial		BS, MS	

Summary Site 5: Virginia Polytechnic Institute and State University

Technology integration, along with support for technology applications, illustrates the signature attribute of CTE programs at Virginia Polytechnic Institute and State University. Faculty members model technology integration and related exemplary teaching in methods courses. As a result of the University's emphasis on technology integration, the faculty also can offer distance-learning courses in remote regions of the State.

Virginia Tech has a nationally recognized senior faculty with exceptional experience in CTE. Almost all are at the top of their profession and stress professionalism in the program. Faculty members have a holistic view of students. They have a sense of pride in their graduates and offer a rigorous field experience and close faculty supervision. These attributes distinguish the CTE program offerings as among the most exemplary in the country. Faculty members also relate their research to their teaching. The State curriculum standards are integrated into the program. Faculty address inquiry and critical thinking by using case studies and other strategies.

Faculty members are leaders in national organizations, and bring these experiences back into the program. Also, faculty members have created strong partnerships with school districts, teachers' associations, and the State department of education. This is a Holmes Group program, and all certification programs require at least a bachelor's degree. Faculty members have strengths in work-based education and clinical-experience supervision. Field experiences are extensive, and supervision is by regular faculty members. Effective partnerships with school districts help to ensure the best placements for the student teachers. Cohesive working relationships among the faculty and access to supportive courses in other disciplines enable graduates to enter the public schools prepared to be effective teachers.

SUMMARY

Table 8 provides a summary of selected characteristics for the five institutions that received the most nominations by "expert" participants in the Delphi study. Highlights of the site visits are presented, followed by a composite set of conclusions that are particularly significant to studying or advancing teacher preparation in career and technical education. The signature attribute denotes the characteristic that stood out as the single most ELI attribute. The distinguishing attributes contribute to the comprehensive ELI picture developed as a result of the case studies completed at each site.

Table 8
Summary of Exemplary, Leading, and/or Innovative Universities' Signature Attributes

Institution	ELI Signature Attribute
University of Georgia	Contextual learning emphasis
University of Minnesota	Cohort field experience
The Ohio State University	Supportive infrastructure of CTE mission
The Pennsylvania State University	State-supported Center for Professional Personnel Development
Virginia Polytechnic Institute and State University	Technology integration and support for technology

Highlights of Exemplary, Leading and/or Innovative CTE Teacher Preparation Programs

The signature attributes found in Table 8 are the key characteristic found at each of the universities. This information helps explain the presence of each university in the national educational arena.

Field Experiences

At the ELI CTE teacher preparation programs, field experiences are rigorous and are often supervised by regular university faculty who have taught the teaching methods courses. "We don't farm that out," said one faculty member, referring to the supervision of student teacher interns. University faculty model professional attitudes and are actively engaged with local school districts. One university admits their students as a cohort, and they are placed in a field experience early in their program. This experience forms a base for the remainder of their

courses. During the field experience, the students also learn to support each other as professionals and as individuals. Another institution has a professional development model that provides certification services (i.e., field/clinical supervision) for non-traditional students employed as teachers in the field, which allows the institution to provide flexibility needed by the students. This model meets needs, provides alternative pathways to certification, and demonstrates institutional flexibility.

Technology Integration

The ELI CTE teacher preparation programs demonstrate a high degree of technology integration. Faculty model this technology expertise through the use of systems, such as Web-CT and Blackboard, and students are expected to be able to use state-of-the-art software systems to support coursework. In some schools, the goal is for all students to complete a digital portfolio as a program requirement and also as a tool to use during their job interview process. For example, Virginia Polytechnic Institute and State University has established distance education courses to serve teachers in remote areas of Southwestern Virginia. Several of these schools were among the nation's 100 most "wired" universities, with everyone connected to the University Library Access and other resources.

Academic Integration

State curriculum standards are closely followed in the ELI CTE teacher preparation programs for each area. Standards are an important part of lesson content during microteaching exercises. At least two of the institutions required students to use state standards as part of a senior-level integration proposal developed with the cooperating teachers and local academic teachers.

Quality Teaching

Improving the quality of teachers has been a national thrust (U.S. Dept of Education, 2000), and is modeled at the exemplary, leading, and innovative (ELI) CTE teacher preparation programs. At the ELI institutions, faculty use portfolio assessment, reflective exercises, concept mapping, cooperative learning techniques, and model exemplary teaching behaviors that their students need to be successful in the field. Faculty are dedicated to their students, and constantly rise to the challenge of updating themselves on content, theory, and methods, such as new technology—spending considerable amounts of time in these areas. The faculty are active with local school districts and advisory groups to help set direction and bring back relevant local experiences into their teaching. Curriculum standards are also a part of their courses, and students learn how to integrate and meet standards through the examples of the faculty. The exemplary faculty are highly visible nationally; they contribute to research conferences, and they lead collaborations on research projects.

Implications for Research and Practice from the Exemplary, Leading, and/or Innovative CTE Teacher Preparation Programs

There is still much to be learned about teaching, learning, and preparing new teachers. The ELI case study data represent some of the best examples of CTE teacher preparation. The ELI institutions have many common characteristics. Programs are designed to ensure a common experiential base among a group of diverse students. Central to their success is the faculty who bring their years of expertise and technical knowledge to their programs. The faculty inspire their students, act as change agents within their universities and communities, form partnerships with schools, and are nationally recognized for their scholarship—all of which is brought into their classrooms.

The ELI institutions were all NCATE accredited and faced new rigorous standards from both their state and national accrediting agencies. The faculty at these programs developed plans to meet these new criteria through programmatic revisions that gave their programs a renewed sense of purpose as sources of new high quality CTE teachers. Intensive field experiences are a vital part of every ELI teacher preparation program. Teachers are prepared in a way that is connected to classroom practice, and they progress through a congruent well-planned sequence of courses. Diversity education is a part of the curriculum and field experiences that many of the students are exposed to. ELI programs are carefully structured to reflect the needs of the students and the profession.

Faculty as Professionals and Role Models

The hiring, promotion, and tenure processes are rigorous and self-selecting at the research institutions. Faculty members tend to be high-profile researchers, who are active both locally and nationally, as researchers and authors. In the words of one senior faculty member, "We're all senior faculty. We have three full and three associate professors. They didn't get there by accident." The faculty feel a responsibility to be actively engaged in their communities at large, serving on advisory boards at school districts, and on state and national committees. This degree of service gives them experiences to take into their classes, better relationships with school districts, and an opportunity to model professionalism for their students.

Exemplary faculty have a holistic view of their students, and are concerned about their students' family life in addition to their academic life. Furthermore, there seemed to be a cohesion among the faculty members that resulted in a shared vision and purpose for their program. Lambert (1998) wrote, "Leadership is about learning that leads to constructive change." The faculty members at the ELI institutions were constantly learning and revising elements of their programs either by updating their course delivery or their course content, or by being involved in new, innovative projects. Faculty are well-connected to professional organizations and encourage—sometimes even require—students to attend professional conferences and present posters or papers. Financial support often is available for students to attend these events.

Delivery of Professional Development

The faculty, students, and administrators at the ELI CTE programs mentioned the rigor of their field experiences and its important role in professional development. The students felt immersed in their professional experiences. Bruening et al. (2001a) found that typical CTE teacher preparation programs deliver professional development in a very traditional manner, and that less than half use a professional development school or other type of school-based system different from a traditional student teaching semester with any regularity. This fact offers an opportunity for professional development that presents the best practices and successful models of school-based professional development for CTE teacher preparation. Higher education faculty also prefer very traditional modes of program delivery for their own professional development, such as workshops or seminars (Bruening et al., 2001a); therefore, higher education faculty may have little recent experience with newer methods of professional development.

Technology

Not only do institutional policies regarding computer support play a critical role in technology integration, but also these policies are a main factor is the faculty's willingness to make the transition to technology-based courses. Support exists in one institution for use of the Blackboard courseware system and for regular hardware upgrades, providing the faculty members take a technology course periodically. Students also are connected to the library and the Internet from off-campus locations and are required to produce certain products, such as Web sites or CDs. Some institutions had "satellite" programs at regional locations via interactive compressed video, and on-line courses to provide educational access in more remote service regions.

Although technology integration may not be uniform at all schools, keeping updated in this area was frequently mentioned as important. Earlier studies have shown that the administrators plan to increase the number of technology-based courses (Bruening et al., 2001b), but the faculty have very mixed feelings about this type of course delivery (Bruening et al., 2001a). Many institutions have made a substantial investment in technology, and this may be the time to optimize that investment by providing professional development opportunities for faculty to model efficient technology-based course delivery.

Standards

The rising admission and exit standards, such as the 3.0 GPA in Pennsylvania, help ensure a better academically prepared student. Perhaps the strongest programs are positioned to attract the best students and do more selective recruiting. Academic standards are integrated into the methods courses, and students are familiar with the standards of their own state as they enter the classroom. The ELI programs are also responsive to standards of their professional organizations. Successful graduates who are knowledgeable about the standards may be the program's best marketing and recruiting tool to ensure strong teacher candidates.

CONCLUDING THOUGHTS

Increasingly, we live and work in a complex and technologically focused society. Every aspect of the workplace demands workers that have a high ability to work with technology and to interface with machines, processes, and procedures. At the same time, federal, state, and local officials are driving teachers and schools to reach for high-stake standards. Students and teachers in higher education must adapt to the demands of the workplace, or our workforce will not keep pace with the information-based world that we all live in. The top-ranked attributes identified in this study will help teacher educators develop benchmarks for the preparation of future teachers. In this study, a cross-section of CTE professionals identified and validated a set of exemplary, leading, and/or innovative characteristics that can provide direction for the field. While these ELI attributes are not particularly novel or unique to this study, they should help the profession retool by focusing our collective efforts in a direction that was collectively derived, and can help teacher education in this time of transition. At the same time, there should be no desire to develop sameness within the field. Rather, the profession should focus on the diversity between and among program delivery models, creativity in developing new certification paths, and unique interests found at these case study schools as a means to create a meaningful dialog that in time will foster change in the profession. The case study institutions all had strong graduate education research that enhanced their undergraduate education—especially in leading research to practice. Additionally, the five institutions studied placed a premium on partnerships with support from outside the institutions. And finally, faculty were a key factor at all of the ELI institutions. The reputation of the program was strongly bonded to vitality and productivity of the faculty—especially in publishing and leadership positions. The framework developed as a result of this study can provide the direction to move CTE teacher preparation reforms forward. This study did not attempt to comprehensively assess all of the innovative teacher education ideas across the field of CTE education. Hopefully, this study could become a catalyst for sharing other exemplary, leading, and/or innovative, ideas in the profession—perhaps via a Web site.

As the number of programs becomes smaller, it becomes increasingly important for those that remain to be highly effective in meeting the needs of the next generation of CTE teachers.

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APPENDIX A

Method–Delphi Survey

The Delphi method OIC is used to solicit input on a topic, build consensus while retaining anonymity, and seek information from experts who do not directly interact with each other (Lee, 1988). It is particularly good at seeking agreement on a complex phenomenon from a geographically dispersed, heterogeneous group. Wonacott (2000) noted that the Delphi method was one of the methods most commonly used in CTE research. Brown, Cochran, & Dalkey (1969), Dalkey, Brown, & Cochran (1969), Warnick (1988), and Mulenga (2001) provided guidelines for using the Delphi method, describing a process for using several rounds of input from a heterogeneous panel of experts in response to a sequence of questions. The number of rounds may depend on how quickly consensus is reached; studies often range from three to nine rounds.

In the present study, a modified Delphi technique was used to generate attributes of exemplary, leading, and/or innovative (ELI) attributes in CTE teacher preparation programs. Researchers analyzed each of three rounds of responses to determine patterns and outliers, which were summarized, ranked, and returned to the panel.

Participants

The panel of expert CTE research participants was built through a nomination system. Each person who was a participant in the study was nominated because it was believed that they were knowledgeable of CTE teacher preparation programs and they could contribute to the ELI theme of this study. The goal was to find experts regarding the higher education system employed in postsecondary and higher education, as well as business, government and industry, with extensive experience in CTE teacher preparation that also were diverse in gender, geography, culture, and career area specialties. According to Lee (1988), a reliable Delphi study can be accomplished with a panel of only 15.

Site directors and the directors of Research and Dissemination Centers, working with the National Research Center for Career and Technical Education, supplied the nominees for this panel. These individuals were invited to submit a list of experts who would be able to participate in a Delphi study regarding the attributes of exemplary, leading, and/or innovative teacher preparation programs.

Invitation letters were sent to potential panelists seeking their participation. By May 2001, 81 potential participants representing 34 states from all regions of the United States had been invited to participate. This initial group had 54 (67%) males and 27 (33%) females. Four individuals declined the invitation to participate in the study, and some attrition occurred between each round.

About two-thirds of the 44 participants in Round II were male. Round II participants represented the following sectors: administrators or faculty in CTE teacher preparation programs (36), community college faculty (2), state or federal departments of education (4), and private

business (2). The diversity of geography, gender, and CTE area of interest in this panel provided a broad base of information, adding credibility to this study.

Delphi Study Procedures

With the letter of invitation, the nominees were given a brief explanation of the Delphi technique and the first survey. In the first round, the instrument posed an open-ended question that asked the experts to list the five most important characteristics of ELI CTE teacher preparation programs. The original data from Round I was structured into a 117-item survey with 15 categories. To maintain confidentiality, each participant was given a code number in Round I, and all response forms were coded. A list of names and codes was maintained to track subsequent rounds.

In Round II, the participants who completed Round I were asked to rate the characteristics identified in Round I on a 4-point Likert-type scale. Descriptive statistics were calculated from the group ratings for each characteristic. Seventy-one items from Round II with means greater than 3.5 were carried into the third round. Respondents had the chance to respond to the group mean for each item.

The study concluded in August 2001 with the third round. The Round II survey used a Likert-type scale, and an on-line version of this survey was also available. A log-in page required each participant to enter his or her unique 5-digit code. Fifty-three participants received Round II materials, which included the 46 who responded to Round I (a 64% return) and several other individuals who indicated interest in the study. There was an 83% response to Round II ($n = 44$), and 25% of Round II responses were submitted on-line. The response rate to Round III was 93% ($n = 41$).

Each round contained a packet of materials consisting of a cover letter, a brief explanation of the analysis of the previous round, directions and objectives for the current round, coded answer/score sheets, and an envelope for return mailing. A summary of the analytic process was sent to participants with each round. These explanations helped maintain an audit trail of the raw data as they were transformed into items for each subsequent round. It also allowed participants to see how their raw data were used.

Case Studies

The purpose of this study was to improve career and technical education by identifying, describing, and synthesizing innovative models of preservice teacher preparation in career and technical education (CTE). Benchmark data were collected from the top-rated universities that Delphi participants had identified as having exemplary CTE teacher preparation programs. Data from these institutions were categorized to identify innovative practices. Once these data had been collected and analyzed, they were to be shared with the profession. By identifying key trends and models, the research team hoped to project future directions for the CTE teacher preparation profession. This was a nationwide study that was sponsored by the National Research Center for Career and Technical Education.

Nomination Procedure

In the second and third rounds of the Delphi study, participants were asked to nominate exemplary CTE teacher preparation programs. The following nationally recognized 4-year institutions received the most nominations in Round II: University of Minnesota (11), University of Georgia (10), The Ohio State University (10), The Pennsylvania State University (9), and Virginia Polytechnic Institute and State University (7). Each is a Ph.D.-granting, NCATE-accredited, public land-grant institution. There was a significant difference between the number of nominations of the top five universities and the remaining 28 institutions that also were nominated (Table 9). The average number of votes for the top five institutions was 9.4, vs. 1.1 for each of the other nominated institutions. Site visits were conducted at the five top institutions named in Round II using the case study approach suggested by Yin (1994).

Table 9
Nominated Round II Institutions Not Included in the Case Study

University of Missouri - 3 nominations	Old Dominion, Virginia
Bowling Green State University – 2 nominations	Pittsburgh State University, Kansas
Cal State–Long Beach	SUNY Buffalo
Cal State–San Bernardino	Temple University, Pennsylvania
Clemson University	Texas A&M University
Colorado State University	University of Arizona
Idaho State University	University of Arkansas
Indiana University of PA	University of Florida
Iowa State University	University of Idaho
Mississippi State University	University of Maryland
North Carolina A&T State University	University of Wisconsin–Madison
Northwest Nazarene University	University of Wisconsin–Stout
Oklahoma State University	West Virginia University
	Western State University–New Mexico

Note: 26 of the 28 institutions received only one nomination from 44 Round-II respondents. The five universities included in the case study are not included in this list (University of Georgia, University of Minnesota, The Ohio State, The Pennsylvania State University, and Virginia Polytechnic Institute and State University). $M = 1.11$ Nominations

Interview Protocols and Data Collection

Questions for the structured interview protocols were derived from the Round III items having means equal to or higher than 3.75. Thirteen statements met this a priori criterion. The objectives of the interviews were to:

- Determine the extent to which each university CTE teacher education program matches the variables established by the experts in the recently completed Delphi portion of the study.
- Identify emerging themes of strength for each university CTE teacher education program visited.
- Identify specific ELI practices that can be recommended to a broad base of university CTE teacher education programs for possible inclusion and program improvement.

The following types of information were collected:

- Structure and curriculum of the teacher preparation program
- Factors that make the teacher preparation program effective
- Specific practices that make the program effective or exemplary

The following data sources were collected:

- Documentation—written reports
- Organizational records—student checklists or course lists
- Interviews—open-ended question approach/focus groups
- Direct observations—casual observations of facilities and processes
- Physical artifacts—(if available)

The interviewees included graduate and undergraduate students, alumni, faculty, department heads, and deans who had special insight into their universities' status as an ELI CTE teacher preparation program. Participants were assured confidentiality, as researchers wanted honest and direct responses. Since the purpose of this study was to highlight and share the positive attributes of each program, uniform interview protocols were used. Focus groups conducted at each site consisted of CTE teachers from high schools in the geographic region of the institutions and current undergraduate and graduate students in the CTE teacher preparation programs. Each group was asked to respond to a series of questions derived from the Round III Delphi study.

The following areas of investigation at each site were represented in the protocols by the following themes:

- Impact of standards regarding the preparation of future CTE secondary/postsecondary teachers
- Program rigor
- Knowledge of teaching/learning processes
- Integration of academic and technical content
- Model exemplary teaching

- Diversity
- Professional development
- Meeting the needs of workforce education
- Partnering
- Exemplary/leading/innovative university practices

Special considerations for interviewing an elite group of individuals were summarized by Bengtson (1994). The basic technique is a standardized, open-ended interview. To triangulate the data, three different protocols were developed for the different levels of interviews (Table 10): faculty, an elite protocol used for department heads and deans, and focus group for students and alumni. Confidentiality was assured, and the interviews were structured to limit the individuals' time requirement, enabling efficient and uniform data collection without revealing sensitive information. The interview transcripts from each site were consolidated into a case study to highlight the salient features of the ELI programs.

Table 10
CTE Exemplary, Leading, and/or Innovative Case Study Protocols

A. Faculty Interview Questions

1. What impact have outcome standards and benchmarks had in your CTE teacher preparation program in the following areas: curriculum, pedagogy, technology, and student learning development?

2. To what extent is your program rigorous and equivalent in scope and depth to other (academic) teacher preparation programs?

3. To what extent or can you provide examples of how you prepare your teachers for classroom management needs?

4. To what extent are your faculty knowledgeable in the following areas: teaching and learning, educational content and processes, assessment, research design, and processes?

5. How do teachers model exemplary teaching?

6. Explain how you integrate academics into career and technology programs.

7. What strategies do you use to emphasize inquiry and critical thinking?

Table 10 - Continued
CTE Exemplary, Leading, and/or Innovative Case Study Protocols

8. Please assess your base of subject matter knowledge including: learning theory, work-based education, general education, and clinical experiences.

9. To what extent do you use instructional strategies and delivery methods based on the concept of "best practices"?

10. In what ways do you emphasize working with diverse populations?

11. What do you do to encourage professional development?

12. How do you update content to be consistent with the evolving needs of workforce education?

13. How do you develop effective partnerships with schools, administration, and teachers?

14. This university and four more were identified as exemplary, leading, and/or innovative CTE teacher preparation programs. What other colleges or universities are you aware of that also fit this category? What do they do that make them exemplary, leading, and/or innovative?

B. Elite Interview Questions

1. What are the characteristics that caused this university to be identified as an exemplary, leading, and/or innovative CTE teacher preparation program?

2. What are the university policies or structure that enabled this university to be nominated as an exemplary, leading, and/or innovative CTE teacher preparation program?

3. Explain how professional development of faculty, students, and/or staff contributed toward this university being nominated as an exemplary, leading, and/or innovative CTE teacher preparation program.

4. This university and four more were identified as exemplary, leading, and/or innovative CTE teacher preparation programs. What other colleges or universities are you aware of that also fit this category? What do they do that makes them exemplary, leading, and/or innovative?

C. Focus Group Questions

1. What are the characteristics that caused this university to be identified as an exemplary, leading, and/or innovative CTE teacher preparation program?

2. Please name the specific practices that this university or your department does that you would consider exemplary, leading, and/or innovative.

Table 10 - Continued
CTE Exemplary, Leading, and/or Innovative Case Study Protocols

3. Explain how the people here at this university contribute to the ideals of exemplary, leading, and/or innovative CTE teacher preparation.

4. Explain how outcome standards are emphasized at this university.

5. Explain how program rigor contributes to teacher preparation programs at this university.

6. Explain how teachers (faculty) at this university model exemplary teaching.

7. This university and four more were identified as exemplary, leading, and/or innovative CTE teacher preparation programs. What other colleges or universities are you aware of also fit this category? What do they do that make them exemplary, leading, and/or innovative?

APPENDIX B

Attributes of Exemplary, Leading, and/or Innovative Career and Technical Education Teacher Preparation Programs

Statements	Round II			Round III		
	N	Group Mean	*SD*	*N*	Group Mean	*SD*
A. Program Standards		**3.65**			**3.71**	
Is rigorous and equivalent in scope and depth to other (academic) teacher education programs	42	3.88	.50	41	3.93	.26
Has outcome standards in place that relate to curriculum, pedagogy, technology, and student learning and development	42	3.88	.45	41	3.85	.48
Leads to a state or national certificate or credential	41	3.66	.57	39	3.69	.52
Is standards based (e.g., NCATE)	40	3.65	.66	40	3.58	.68
Uses benchmarks to assess its programs	44	3.55	.59	41	3.51	.60
Is nationally accredited	44	3.30	.85	*	*	*
B. Vision/Mission Philosophy		**3.58**			**3.64**	
Integrates academics into career and technology programs	40	3.80	.41	41	3.73	.45
Demonstrates partnering effectiveness with schools, administrators, and teachers	40	3.75	.44	39	3.69	.47
Emphasizes contextual teaching and learning	41	3.73	.50	41	3.68	.47
Provides a strong grounding in pedagogy	41	3.71	.51	41	3.68	.52
Has a strong field-based component	41	3.68	.57	41	3.66	.57
Incorporates new teaching/learning philosophies	41	3.59	.55	41	3.56	.50
Encourages mentor–mentee relationships for teachers	41	3.59	.55	41	3.56	.55
Provides opportunities for individuals to enter the program from a wide variety of backgrounds	41	3.56	.55	38	3.53	.56
Reflects a broad view of work-based education	40	3.45	.55	*	*	*
Builds teaching competence from a technical base	39	3.31	.69	*	*	*
Provides alternative methods of teacher certification	41	3.24	.80	*	*	*

Statements	Round II			Round III		
	N	Group Mean	*SD*	*N*	Group Mean	*SD*
C. Program Grounding and Development		**3.47**			**3.73**	
Has a strong base of subject matter including learning theory, work-based education, general education, and clinical experiences	43	3.79	.41	41	3.83	.38
Incorporates extensive field experiences early in the program and continues through the teacher education program	43	3.63	.66	41	3.63	.54
Is based on private sector trends in the implementation of technology	41	3.32	.61	*	*	*
Incorporates state initiatives and processes	44	3.32	.64	*	*	*
Is based on knowledge of secondary and postsecondary career pathways	42	3.29	60	*	*	*
D. Linkages/Cooperation		**3.41**			**3.59**	
Establishes a solid educational partnership to collaborate with community colleges, business, and industry	39	3.59	.50	39	3.59	.50
Cooperates with CTE centers, comprehensive high schools, and school districts in program delivery	39	3.44	.64	*	*	*
Has an effective working relationship with colleges of education	41	3.41	.67	*	*	*
Has an effective working relationship with student organizations and employees	40	3.33	.69	*	*	*
Has an effective working relationship with state departments of education	42	3.40	.66	*	*	*
Has an effective working relationship with state teachers' associations	40	3.30	.72	*	*	*

Statements	Round II			Round III		
	N	Group Mean	*SD*	*N*	Group Mean	*SD*
E. Accessibility/Recruitment		**3.52**			**3.62**	
Seeks alternative student populations from diverse backgrounds	43	3.74	.44	41	3.76	.43
Offers courses at various locations and flexible times	43	3.60	.58	41	3.59	.55
Has a multi-faceted recruitment program	42	3.60	.50	40	3.58	.50
Provides opportunities for individuals to enter the program from a wide variety of backgrounds	43	3.58	.50	41	3.54	.50
Practices ongoing student recruitment	43	3.47	.55	*	*	*
Provides access to financial support/aid	43	3.42	.63	*	*	*
Builds endowments and support for scholarships	44	3.20	.59	*	*	*
F. CTE Program Delivery		**3.20**			**3.74**	
Emphasizes working with diverse populations	43	3.77	.43	41	3.73	.45
Exercises high expectations and performance standards throughout the program	43	3.72	.55	40	3.78	.48
Involves teachers not only in certification but also in professional development efforts	42	3.69	.47	40	3.70	.46
Allows students to take electives in technical fields that support specialty areas	40	3.33	.66	*	*	*
Builds teaching competence on the basis of technical expertise	43	3.23	.61	*	*	*
Connects content area to individualized instructional methodology	41	3.22	.76	*	*	*
Exercises rigorous admission standards	41	3.12	.75	*	*	*
Provides links directly to industry training programs	41	2.83	.86	*	*	*
Has degree completion rather than certification as a terminal objective	41	2.78	.91	*	*	*
Certifies teachers after 1 full year of a successful classroom teaching internship	37	2.51	.90	*	*	*

Statements	Round II			Round III		
	N	Group Mean	*SD*	*N*	Group Mean	*SD*
G. Program Characteristics		**3.56**			**3.65**	
Uses teachers who model exemplary teaching	42	3.83	.38	41	3.83	.36
Uses instructional strategies and delivery methods based on "best practices" concepts	44	3.77	.48	41	3.76	.49
Provides flexible program delivery methods	42	3.67	.53	41	3.63	.54
Emphasizes the use of instructional technology	43	3.65	.57	41	3.61	.59
Integrates group processes, team building, and reflective thinking into the program	43	3.65	.53	41	3.63	.49
Uses appropriate instructional technology and up-to-date facilities	42	3.60	.50	41	3.59	.50
Delivers instruction through a field-based and competency-based model using a real classroom setting with secondary students	42	3.52	.71	41	3.51	.68
Integrates the use of distance education and web-based technology	44	3.52	.66	*	*	*
Accommodates small class sizes	41	3.24	.73	*	*	*
Provides opportunities for individualized instruction	43	3.19	.85	*	*	*
H. Admission Standards/Program Entry		**3.17**			**3.54**	
Accepts course work from 2-year institutions that offer technical specialty areas	40	3.59	.55	39	3.54	.68
Accepts industry experience as part of the overall career and technical education program	38	3.26	.72	*	*	*
Bases admission criteria on occupational experiences and academic performance	41	3.17	.59	*	*	*
Screens students with aptitude tests and assessments	40	2.65	.74	*	*	*

Statements	Round II			Round III		
	N	Group Mean	*SD*	*N*	Group Mean	*SD*
I. Faculty Qualifications/Expertise		**3.24**			**3.71**	
Has faculty who are knowledgeable in the areas of teaching and learning, educational content and processes, assessments, and research design and processes	43	3.84	.37	41	3.85	.36
Has faculty who seek out and implement innovative and alternative teaching strategies	43	3.74	.44	41	3.73	.45
Has faculty who model leadership in CTE teacher preparation programs	42	3.67	.61	41	3.66	.62
Has faculty who share vision for direction and operation of their programs	42	3.64	.48	41	3.66	.48
Updates content to be consistent with the evolving needs of workforce education	42	3.53	.63	41	3.63	.49
Has faculty involved in reform efforts at the university, state, and national levels	41	3.37	.80	*	*	*
Has faculty who have occupational experiences in technical careers	41	3.37	.80	*	*	*
Has faculty who have a long duration of involvement in teaching, research, and service to teacher education	42	3.17	.85	*	*	*
J. Skills Development		**3.54**			**3.65**	
Emphasizes practices relative to teaching students in diverse settings	43	3.74	.44	41	3.76	.43
Teaches the integration of academic skills into the workplace setting	43	3.70	.47	41	3.68	.47
Teaches leadership skills	42	3.64	.53	41	3.63	.49
Emphasizes practices relative to teaching special needs students	43	3.56	.50	41	3.54	.60
Teaches needs assessment skills	43	3.51	.55	*	*	*
Teaches planned change strategies	43	3.51	.51	*	*	*
Teaches marketing skills	41	3.12	.64	*	*	*

Statements	Round II			Round III		
	N	Group Mean	*SD*	*N*	Group Mean	*SD*
K. Performance Standards/Program Exit		**3.40**			**3.60**	
Certifies students who achieve a high level of performance in technical, pedagogical, and professional content areas	43	3.70	.46	41	3.71	.46
Has ongoing assessment of pedagogical competencies	43	3.60	.49	41	3.59	.50
Assesses students on their ability to conduct complex and authentic tasks	42	3.52	.63	39	3.51	.64
Has a high degree of focus on evaluating learning outcomes for individual learners rather than class/group management	42	3.50	.51	*	*	*
Certifies graduates based on a qualifying exam	42	2.69	.84	*	*	*
L. Curriculum Content		**3.61**			**3.70**	
Prepares teachers for classroom management needs	43	3.84	.54	41	3.80	.56
Updates contents to be consistent with the evolving needs of workforce education	42	3.76	.43	41	3.78	.42
Has curriculum informed by educational research	43	3.72	.45	41	3.63	.62
Has a comprehensive program offering subjects such as curriculum development, classroom management techniques, foundation of vocational education, instructional methods and techniques, identification and instruction of students with special needs, and comprehensive student assessment	42	3.71	.60	40	3.67	42
Provides education in planning programs of instruction and curriculum	43	3.70	.60	41	3.68	.61
Includes knowledge/skill development related to instructional technology	43	3.65	.57	41	3.66	.48
Provides adequate opportunity for technical education in the discipline	40	3.43	.71	*	*	*
Has a competency-based curriculum	42	3.36	.73	*	*	*
Gives credit for occupational competencies and experience	39	3.28	.83	*	*	*

Statements	Round II			Round III		
	N	Group Mean	*SD*	*N*	Group Mean	*SD*
M. Program Support/Retention		**3.45**			**3.67**	
Encourages continued professional development	43	3.77	.43	41	3.76	.43
Has adequate professional and support staff	42	3.74	.45	40	3.73	.45
Provides adequate opportunities for prospective teachers to practice under a mentor teacher	43	3.72	.50	40	3.75	.44
Has adequate budget and staffing for both undergraduate and graduate instruction	42	3.69	.52	40	3.68	.53
Has a well-defined support network throughout the state	43	3.53	.67	40	3.43	.68
Provides contact with 1st-year teachers through a cohort group	42	3.36	.79	*	*	*
Has linkages to student organizations that offer vision to CTE programs	41	3.29	.78	*	*	*
Provides on-site mentoring with mentors who have a reduced class load	41	3.17	.70	*	*	*
Creates a study group with university affiliation	40	2.85	.80	*	*	*
N. Instructional Methods		**3.59**			**3.65**	
Emphasizes inquiry and critical thinking	43	3.79	.41	41	3.78	.42
Emphasizes appreciation for and understanding of the importance of working with diverse groups of students	43	3.70	.51	41	3.76	.43
Uses cooperating teachers as role models	42	3.69	.47	40	3.68	.47
Assists teachers with methods and strategies for updating curriculum to current needs	42	3.64	.48	40	3.65	.48
Relates value to education through work	38	3.55	.55	36	3.61	.49
Emphasizes multidisciplinary practices in conjunction with traditional classroom and laboratory instruction	39	3.54	.51	39	3.51	.51
Incorporates a meaningful capstone learning experience	39	3.54	.64	36	3.53	.65

Statements	Round II			Round III		
	N	Group Mean	*SD*	*N*	Group Mean	*SD*
N. Instructional Methods - Continued		**3.59**			**3.65**	
Ties classroom needs to communities	41	3.46	.67	*	*	*
Analyzes critical issues that affect the CTE profession	42	3.40	.66	*	*	*
O. Program Design		**3.49**			**3.60**	
Is student oriented	43	3.72	.45	41	3.73	.45
Has experientially based contents that feature extensive fieldwork in both the professional and content areas	42	3.64	.53	41	3.66	.53
Has a reflection (self-evaluation) component tied to the internship	43	3.60	.54	41	3.56	.55
Includes instruction on the integration of technical content into academic programs	43	3.58	.54	41	3.56	.55
Has balance between classroom instruction and field experiences	43	3.58	.50	41	3.51	.51
Is based on professional and workplace standards	40	3.58	.55	40	3.60	.55
Meets needs of all learners such as disadvantaged, disabled, the average, the gifted, and students with an IEP	42	3.57	.50	39	3.59	.50
Provides a means to review curriculum to prevent repetition of content	42	3.43	.63	*	*	*
Includes case studies, where appropriate	42	3.31	.72	*	*	*
Has business/industry partnership components	41	3.29	.64	*	*	*
Examines the historical role of CTE in society	41	3.12	.68	*	*	*

* These items were not included in Round III because only items with a mean rating of 3.5 or higher were included in Round III.

Note: Agreement with these attributes was indicated with a 4-point Likert-type scale: 1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree, and 9 = don't know.

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